

**SALTICIDAE OF THE PACIFIC ISLANDS.  
I. DISTRIBUTION OF TWELVE GENERA, WITH  
DESCRIPTIONS OF EIGHTEEN NEW SPECIES**

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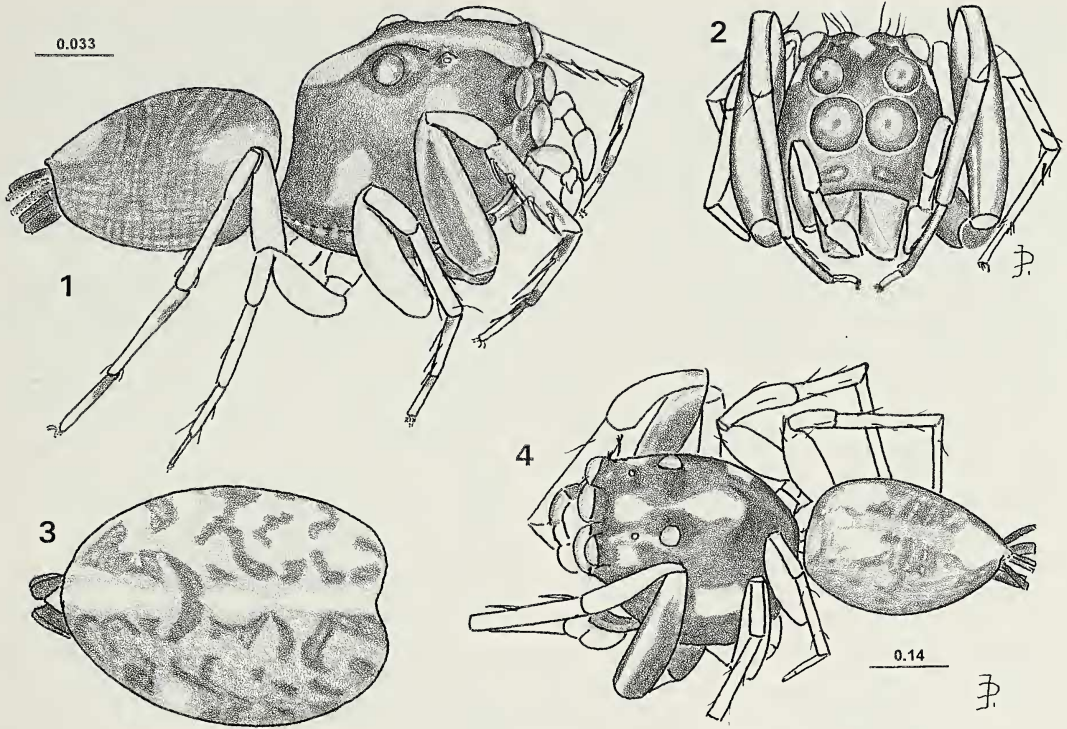
**ABSTRACT.** Pacific salticids of the genera *Athamas*, *Bianor*, *Efate*, *Ergane*, *Euophrys*, *Evarcha*, *Holoplatys*, *Myrmarachne*, *Omoedus*, *Palpelius*, *Phintella*, and *Zenodorus* are discussed. Eighteen new species are described: *Bianor obak*, *Bianor vitiensis*, *Efate fimbriatus*, *Efate raptor*, *Ergane carinata*, *Euophrys wanyan*, *Euophrys kororensis*, *Euophrys bryophila*, *Evarcha reiskindi*, *Holoplatys carolinensis*, *Myrmarachne edentata*, *Myrmarachne pisarskii*, *Myrmarachne edwardsi*, *Omoedus cordatus*, *Palpelius namosi*, *Palpelius trigyrus*, *Phintella planiceps*, and *Zenodorus ponapensis*. Illustrations and distribution records are presented for all new species. In the widespread species *Athamas whitmeei*, morphological variation on several islands is illustrated. *Efate albobicinctus* and *Zenodorus microphthalmus* are illustrated for comparison with newly described species.

Knowledge of spiders from the Pacific Islands extends back at least as far as Nieremberg (1635) which includes mention of spiders from the East Indies. Later, Walckenaer (1837) described spiders from the Mariana Islands, Celebes, Bismarck Archipelago and Tonga. In *Die Arachniden Australiens*, L. Koch (1871–1881) included a number of species that occur on the islands. Occasional data on Pacific species are scattered in many papers by various authors.

Until recently, intensive studies of Pacific spiders by spider specialists, or collections personally obtained by them, have been lacking. Most of the literature published from 1900–1950 has been the work of Berland (in numerous papers). Since 1950 there have been studies by Marples (1955a, 1955b, 1957, 1959a, 1959b, 1960, 1964), Chrysanthus (1958, 1959, 1960, 1961, 1963, 1964, 1965, 1967a, 1967b, 1968, 1971, 1975), Suman (1964, 1965, 1967, 1970), Levi (1967),

Gertsch (1973), Lehtinen & Hippa (1979), Lehtinen & Saaristo (1980), Lehtinen (1981, 1993), Okuma (1987) Beatty & Berry (1988a, 1988b), Beatty et al. (1991), Berry (1987), Berry & Beatty (1989), Platnick (1993), Gillespie (1991, 1992, 1994), and Benton & Lehtinen (1995). Most of these have dealt primarily with spiders from the larger continental islands (Chrysanthus—New Guinea; Platnick—New Caledonia) or Hawaii (Gertsch; Gillespie; Suman), or with specific taxa (Suman; Gillespie; Lehtinen & Hippa; Lehtinen & Saaristo; Lehtinen; Beatty & Berry; Berry & Beatty; Beatty et al.). Data on the spider fauna of the oceanic islands remain relatively sparse.

This is the first of a series of papers dealing with the species of jumping spiders found on the Pacific Islands and the distribution patterns of those species on the islands. Except for Wanless's (1978) revision of the genus *Sobasina*, very little specifically on Pacific sal-



Figures 1–4.—*Athamas whitmeei* from Kusaie, Caroline Islands. 1, Lateral view of male; 2, Frontal aspect of male; 3, Abdominal pattern of female; 4, Dorsal view of male.

ticians has been published. However, records of various Pacific salticids are scattered among the papers cited above. Berland (1934) listed 40 salticid species from Polynesia. In later papers, which included other Pacific areas, he added 15 more. Marples described six new species from the Cook Islands, Tonga, Samoa and Fiji. The New Guinea fauna described by Chrysanthus overlaps the fauna of the smaller oceanic islands only in the case of cosmopolitan or widespread Pacific species (e.g., *Bavia aericeps* Simon 1877, *Menemerus bivittatus* (Dufour 1831), and *Plexippus paykullii* (Aud. 1825)). A summary of the distribution of salticid species of the Pacific and Indonesian Islands, based both on literature and study of large collections, is given by Prószyński (in press).

The collections on which this paper is based were made primarily by James W. Berry, Elizabeth R. Berry, and Joseph A. Beatty (noted as JWB, ERB and JAB in the Material examined sections) in a series of collecting trips: Marshall Islands (1968, three months; 1969, three months); Palau (1973, six months);

Guam, Yap, Truk, Ponape, Taiwan (1973, 1–2 weeks each); Yap (1980, six months); Marquesas, Tuamotu, Society, Cook and Fiji Islands (1987, six months total); and Hawaii (1995, one month). Specimens borrowed from the Bishop Museum (BPBM) and the American Museum of Natural History (AMNH) were also examined and are occasionally referred to. We treat here 22 species in 12 genera, of which 18 species are new.

We are aware that a few of the newly-described species do not fit comfortably in the genera to which they have been assigned. In the present state of salticid taxonomy, with over 400 genera (many of them essentially undefined) to consider, we can do no better. For this reason we have included brief descriptions of most genera. These descriptions apply only to the Pacific species of these genera and may or may not be correct for species from other regions. Diagnoses of genera are intended to distinguish only among genera reported from the Pacific Island region. Attempting to discriminate among all salticid genera of the world is a hopeless task in the current state of



taxonomy of the family. We define the Pacific region as including only Micronesia and Polynesia (including Fiji). The islands of Melanesia, the eastern Pacific, Philippines, Indonesia and vicinity of Australia and New Zealand are excluded. In the descriptions the genera are categorized by size as follows: small, 2–4 mm total length; medium, >4–8 mm; large, >8–16 mm; and very large, over 16 mm. The anterior, middle and posterior eye rows are referred to, respectively, as eyes I, eyes II, and eyes III. All measurements are in mm.

Simon (1901–1903) divided the salticids into unidentate, fissidentate and pluridentate groups of genera, but even he regarded this division as somewhat artificial. Recent workers (e. g., Davies & Žabka 1989) show increasing dissatisfaction with this arrangement. Numerous cases of apparent convergence in various characters that have been used taxonomically further complicate matters.

In salticids there are currently genera that differ in non-genital characters but have genitalia of the same form (e.g., *Harmochirus*—fissidentate, and *Bianor*—unidentate). Likewise, there are species of virtually identical somatic structure but with very different genitalia (e.g., *Coccorchestes* and an undescribed Pacific species provisionally assigned to *Sobasina*). Which set of characters should be considered more important for determining generic limits is currently moot.

Species limits in widespread Pacific genera also present a difficult problem. Among the three authors of this paper, there are differing opinions regarding whether each island or compact group of islands has endemic species in many genera. For that reason, we have used a broader species definition until intra-species variation in relation to inter-island variation of those species can be examined more closely.

To exemplify this treatment we present illustrations (Figs. 1–17) of variation in what we refer to as *Athamas whitmeei* from several islands. Initially these variants were treated as separate species; but, after examination of a number of specimens from each of several islands, we decided to leave them combined as a single species. There may be more than one species in this genus, but sufficient evidence for distinguishing them from each other does not exist currently.

Most of the salticid genera recorded from

the Pacific occur also in Asia and/or Australia. Few genera, except for those that are cosmopolitan, are common to the Pacific Islands and South America. Of the 42 genera recorded from Micronesia and Polynesia, 10 are restricted to the Pacific Islands (including, in this case, Melanesia). We treat two of these here (*Athamas* O. Pickard-Cambridge 1877 and *Efate* Berland 1938).

The holotype and other specimens of *Euphrys bryophila* new species are in the American Museum of Natural History (AMNH). Holotypes of the other new species will be deposited in the Bernice P. Bishop Museum (BPBM) (State Museum of Hawaii) in Honolulu. All adult specimens are paratypes unless specifically excluded in the text; juveniles are not paratypes.

Genus *Athamas* O. Pickard-Cambridge 1877

**Discussion.**—Members of the genus *Athamas* are widespread in the Pacific region, occurring from the western Caroline Islands to Henderson Island. Initially several species had been distinguished among our material on the basis of differences in size, color, length of the tibial apophysis of the male palp, clypeal height, number of spines of the male tibia I and slight variations in the palpal embolus and bulb. Examination of a number of specimens from each of several islands showed that most of these characters were highly variable on each island, especially size, coloration and male palpal apophysis. Figures 5–7 show some of the variations in epigyna, and Figs. 13–17 show the variations from island to island in the male palps. The number of tibial spines on the male first leg is correlated with the size of the spider and varies overall from 4–7 pairs. A range of 5–7 pairs was found in a few specimens from Kusaie, Caroline Islands.

The characteristics of tramp species appear to be well exemplified by *A. whitmeei*—abundance, wide distribution, a high level of variation and occurrence in marginal areas (e.g., Eniwetok, a relatively dry atoll on the north edge of the Pacific Island region). Localized speciation is not expected in tramp species because of their effective means of dispersal. Salticidae are known as reasonably effective ballooners (Salmon & Horner 1977).

Before recognizing a series of species in the genus a careful study of intra-population vari-



Map 1.—Major island groups of the Pacific Ocean. The three major divisions are (1) Micronesia, including the little islands in the western Pacific and generally north of the Equator (primarily the Caroline Islands, Mariana Islands, and the Marshall Islands), (2) Polynesia, forming a huge triangle in the central Pacific, with 17 different island groups (including Hawaii, Samoa, Tonga, Cook Islands, Society Islands and Marquesas), and (3) Melanesia, including Fiji and the islands to its west (excluding Indonesia).

ation for several island groups is required. It is entirely possible that more than one species does exist, but until we have stronger evidence we will not describe as species the variation in these spiders that we have seen from island to island.

**Diagnosis.**—This is an unusual salticid genus with an eye pattern clearly of the lysso-manine type (i.e., arranged in four rows, ALE positioned directly above AME), but the palpal organ is of the euphryine type (i.e., with the sperm duct looping inward (Figs. 15, 16) rather than being without convolutions (Figs. 27). The facial appearance is dominated by huge anterior median eyes (AME). The leg spination is also unusual: tibia I has 4–7 pairs of ventral spines, three of which are very long, metatarsus I with three pairs of long spines and tarsus I also with one pair of long spines. The cheliceral retromargin appears unidentate but has a minute second cusp on the side of the tooth nearer the base of the fang.

*Athamas whitmeei* O.P.-Cambridge 1877  
Figs. 1–17, Map 1

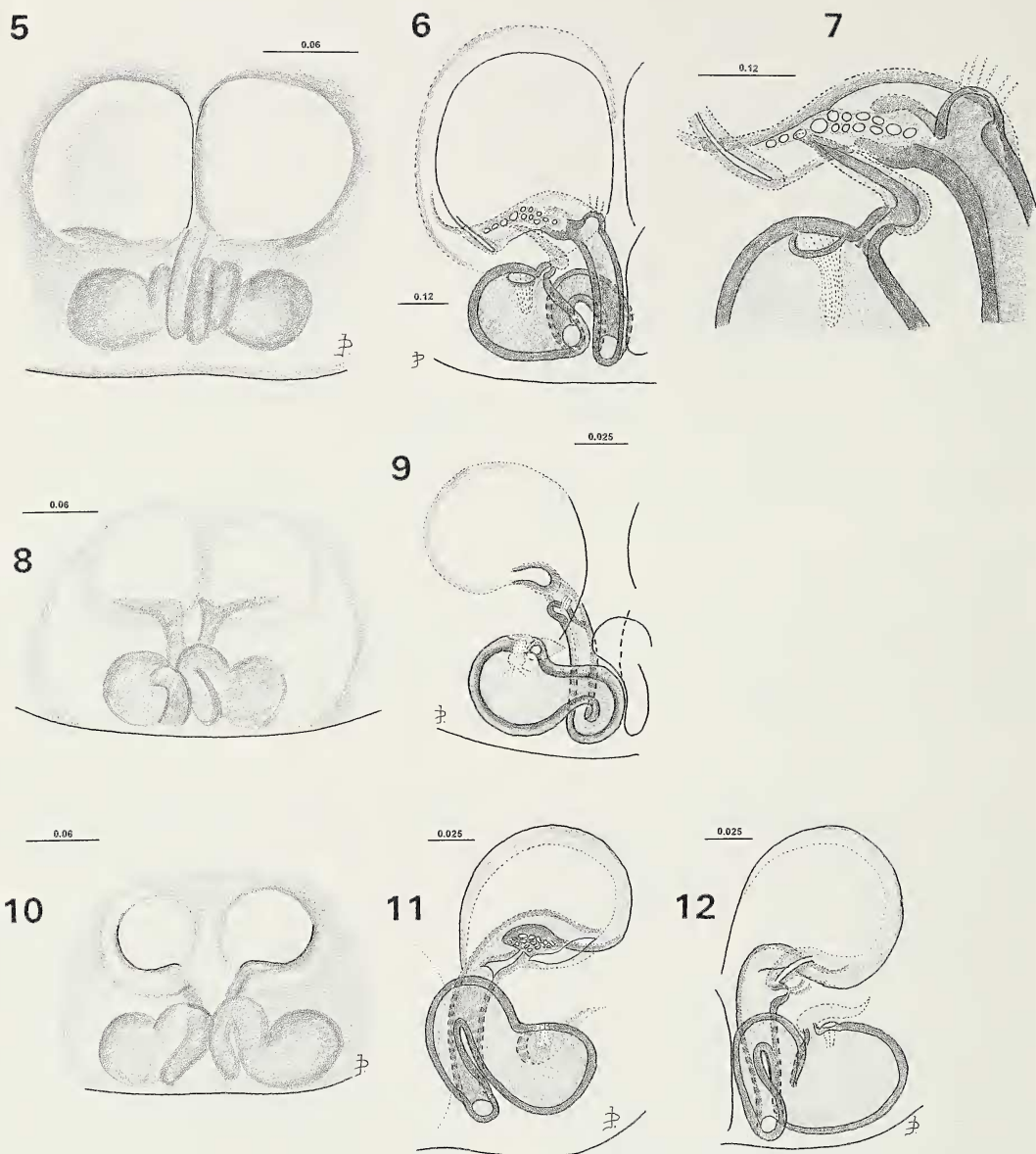
*Athamas whitmeei* O. P.-Cambridge 1877. Type from Samoa in Hope Entomol. Coll., Oxford University, Oxford, U.K., examined.

*Athamas univittata* Berland 1938. Female holotype from New Hebrides, Efate, Port Vila, June 1933, Risbec, in MNHN, Paris. First synonymized by Benton & Lehtinen 1995.

**Discussion.**—Berland distinguished *A. univittata* from *A. whitmeei* solely by the color pattern (“le dessin si particulier”) of the unique female specimen. He cited the constancy of color pattern in *A. whitmeei* as justification for regarding *univittata* as a separate species (“donnée la grande fixité du dessin de *whitmeei*”). Without supporting evidence from other characters we are reluctant to recognize more than one species in the genus. Recently Jendrzejewska (1995) described four new *Athamas* species on the basis of one or two specimens each. No evidence concerning intrapopulation variation in any of the characters was presented. One species was based on a single specimen differentiated only by the absence of patches of white hairs on the carapace. These hairs are easily rubbed off, and their absence may be the result of handling. Additional information from DNA or protein analysis could show whether or not they are different.

**Description.**—*Male*: ( $n = 5$ ). Total length

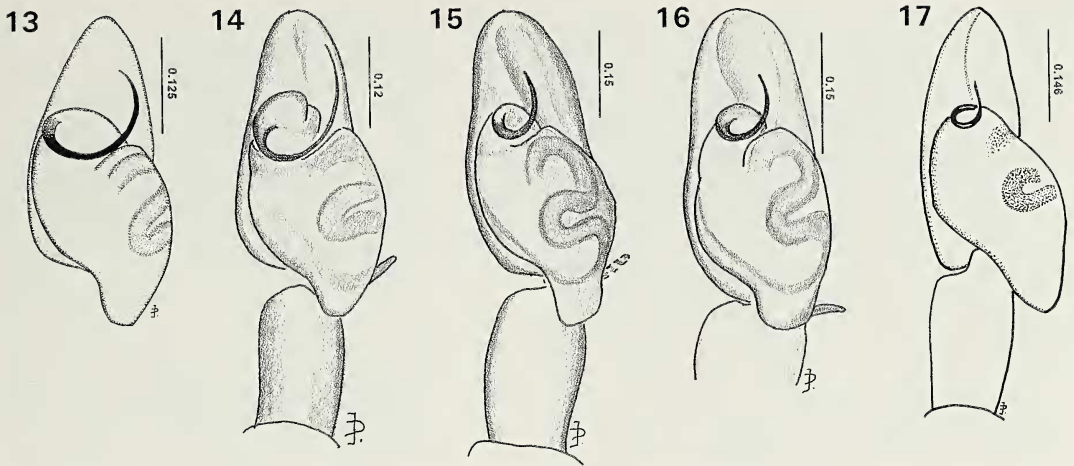




Figures 5-12.—Comparison of epigyna of *Athamas whitmeei* from various islands. 5-7. Female from Pulo Anna (Palau Islands); 5, Epigynum; 6, Internal structure of epigynum; 7, Details of copulatory ducts and pores; 8, 9, Epigynum of female from Kusaie (Caroline Islands) and internal structure showing single spermatheca and channels; 10, 11, Epigynum of female from American Samoa (Tutuila Island) and internal structure showing single spermatheca and channels; 12, Internal structure epigynum of female from Samoa, showing single spermatheca and ducts.

2.50-2.70 ( $\bar{x}$  = 2.56), length of carapace 1.25-1.35 ( $\bar{x}$  = 1.28), maximum carapace width 1.00-1.10 ( $\bar{x}$  = 1.06), eye field length 0.65-0.90 ( $\bar{x}$  = 0.78), eye row I width 0.70-0.75 ( $\bar{x}$  = 0.73). Carapace dark brown with six patches of orange scales (white in long-preserved specimens): one in middle of eye

field, another on the anterior, flat part of thorax, usually connected by a line of scales of various width; a pair of isolated spots just below eyes II, and another pair on sides of thorax anteriorly. Eyes large, clypeus height varies from 60-85% the diameter of AME. Two retrolateral cheliceral teeth, three prolateral



Figures 13–17.—Comparison of male palps of *Athamas whitmeei* from various Micronesian and Polynesian locations. 13, From Samoa Island, locality unknown (drawn by J. Prószyński in 1977, with permission from the WSRP, Siedlce, Poland); 14, From Pulo Anna Island in Palau (Caroline Islands); 15, From Tutuila (American Samoa); 16, From Kusaie (Caroline Islands); 17, From Tahiti (Society Islands) (drawn in 1980, with permission from WSRP, Siedlce, Poland).

cheliceral teeth. Abdomen heart-shaped, with two areas of bright orange scales. An oval spot in front of the spinnerets and a broad anterior area, sometimes divided, are black or dark grey. *Legs*: Leg formula 1-3-4-2; tibia-patella I length, 1.00–1.20 ( $\bar{x}$  = 1.12); patella-tibia III  $\geq$  IV. Males are characterized by the very long leg I, with particularly long femur and tibia, in preserved specimens usually bent and held close to face. *Palp*: Simple, with bulb produced proximad beyond cymbium, overlapping tibia. Tibial apophysis short-to-long, straight-to-slightly curved. Embolus arising from apex of bulb, curving counterclockwise, making about  $\frac{3}{4}$  of a circle. Loop of embolus varying in diameter, length of embolus variable (Figs. 13–17).

*Female*: ( $n$  = 5). Total length 2.45–3.15 ( $\bar{x}$  = 2.73), length of carapace 1.20–1.35 ( $\bar{x}$  = 1.27), maximum carapace width 0.95–1.05 ( $\bar{x}$  = 1.00), eye field length 0.65–0.80 ( $\bar{x}$  = 0.73), eye row I width 0.70 ( $\bar{x}$  = 0.70). Color pattern is a mosaic on both carapace and abdomen, consisting of a number of irregular, greyish or brownish grey spots on a pale background. The only contrasting element is a narrow, straight line of shining scales, orange (fresh) or white (preserved), which runs along carapace and abdomen, on the latter broken by dark spots in one or two places. Cheliceral teeth as in male. Shape of carapace and ab-

domen similar to male, but legs I and their segments are usually shorter. *Legs*: Leg formula 1-4-3-2, patella-tibia III  $\geq$  IV. Patella-tibia I length 0.90–1.00 ( $\bar{x}$  = 0.97). Ventral spines on tibia I usually five. *Epigynum*: Main diagnostic character is the epigynum with its internal structures. Epigynum with two anterior white membranous windows, round or oval, with sclerotized globular spermathecae and ducts visible behind them. Internal structures originate at the slit-like opening. First is a transverse membrane or lightly sclerotized duct running transversely along the posterior edge of the window. This duct carries a strange sieve-like structure at its internal wall consisting of apparently numerous minute openings. It passes into a sclerotized and thick-walled longitudinal duct, which has a distinct lateral swelling with transparent pores running from it. Longitudinal duct runs posteriorly and turns into a semicircular loop, of varying shape and diameter, which joins the spherical spermatheca. The spermatheca has distinct pores near its posterior cone. Membranous structures may be visible only when stained in Chlorazole Black E.

**Material examined.**—**SOCIETY ISLANDS**: Tahiti, 1884 (NHM Wien). “*Athamas whitmeei* Cbr. Samoa Isl.”, 1♂, presumed to be one of the two syntypes, Coll. O. P.-Cambridge, Hope Entomol. Coll., Oxford Univ., Oxford, UK. **SAMOA**: *Salai-*



lus, W172:S14, 1♀, 20 May 1926 (E.H. Bryan) (AMNH). *Safune*, W172:S, 1♀, 14 May 1924 (E.H. Bryan) (AMNH). (The following specimens were collected by JWB, ERB and/or JAB; only islands and number of specimens are listed because of space limitations.) **CAROLINE ISLANDS:** *Palau Dist.*, 17♂28♀17imm.; *Yap*, 10♂14♀6imm.; *Ulithi*, 2♂3♀7imm.; *Truk*, 3♂9♀3imm.; *Ponape*, 2♂1♀8imm.; *Kusaie*, 2♂1♀1imm.; **MARSHALL ISLANDS:** *Eniwetok*, 1♂6♀2imm.; *Kwajalein*, 11♂11♀14imm.; *Majuro*, 15♂17♀14imm.; **FIJI ISLANDS:** *Viti Levu*, 1♂1♀2imm.; **AMERICAN SAMOA:** *Tutuila*, 2♂3♀4imm.; **SOCIETY ISLANDS:** *Moorea*, 1♀; **COOK ISLANDS:** *Aitutaki*, 3♂4♀3imm.; *Rarotonga*, 1♂3♀1imm.; **MARQUESAS ISLANDS:** *Fatu Hiva*, 1♂1♀; *Hiva Oa*, 2♂5♀3imm.; *Nuku Hiva* 9♂5♀3imm.

**Distribution.**—Fiji, Henderson, Mangareva, Niue, Samoa and the Austral, Caroline, Cook, Loyalty, Marshall, Marquesas, Society and Tokelau Islands.

Genus *Bianor* Peckham & Peckham 1885

**Diagnosis.**—Resembles *Harmochirus* Simon 1885 and *Modunda* Simon 1901 in genitalic characters and body form. Differs from *Harmochirus* by being unidentate rather than fidentate. Differs from *Modunda* by having the carapace higher and broader at third eye row, ocular quadrangle wider behind than in front, flat surface of carapace ending abruptly behind posterior eyes and passing into the very steep posterior slope of the thorax. Bulb of male palp truncate, rather than rounded.

**Descriptive notes.**—Recognizable by central hood of the epigynum and the palpal organ, in which the bulb always seems to be truncated anteriorly, while more or less rounded in other related genera. Integument of carapace hardened with pitted surface, brown. Unidentate, with tibia I with three pairs of spines.

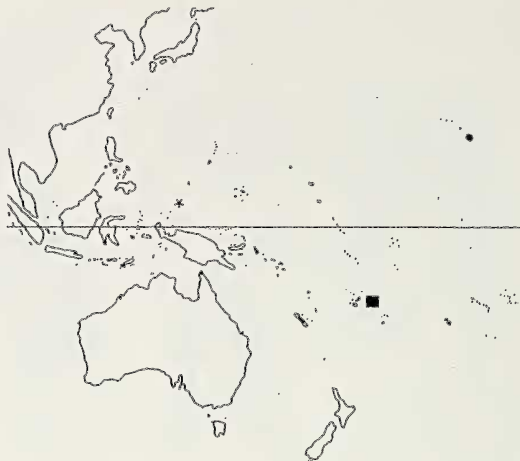
*Bianor obak* new species

Figs. 18–24, Map 2

**Holotype.**—Female from Caroline Islands, Palau District, Peleliu Island, grass sweeping, 23 March 1973 (JWB & ERB) (BPBM).

**Etymology.**—The species name is a noun in apposition for the Obak, a chief on the island of Peleliu, where the type specimen was collected.

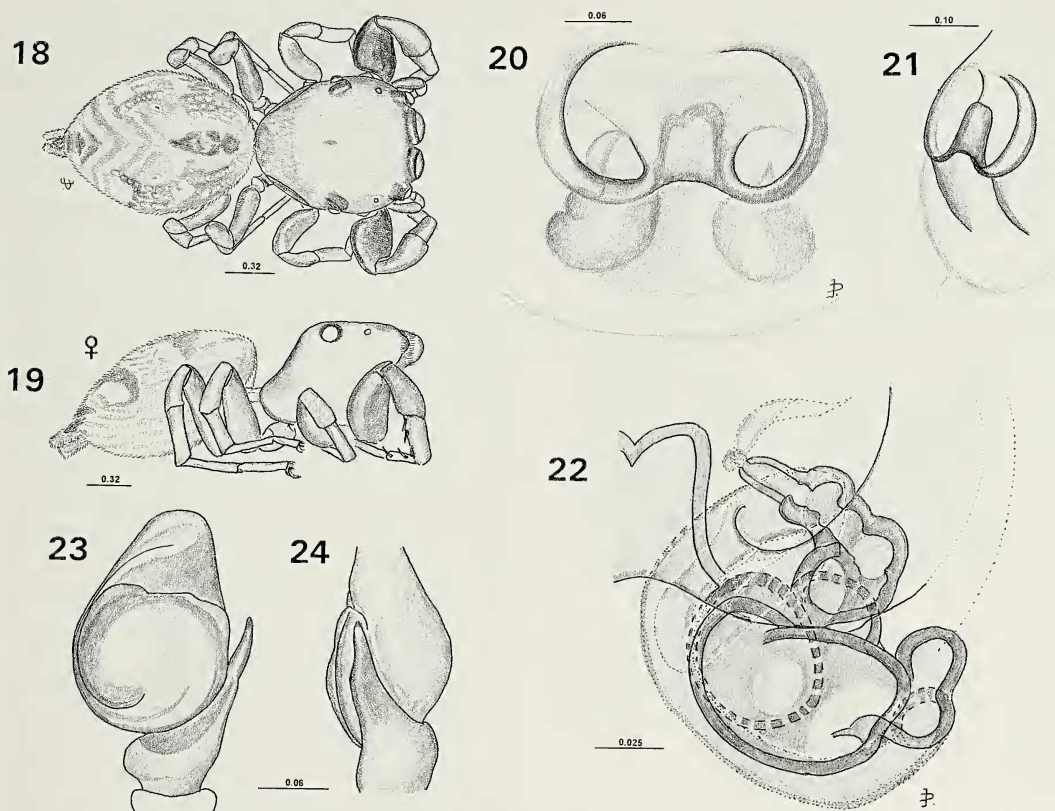
**Diagnosis.**—Setae surrounding eyes I in male entirely white. Anterior margin of palpal bulb truncate perpendicular to long axis of



Map 2.—Distribution of *Bianor obak* new species (\*) in the Palau Islands and *Bianor vitiensis* new species (■) on Viti Levu in Fiji.

cymbium, embolus forming a circle. Palpal tibia shorter and tibial apophysis longer than in *B. vitiensis* new species. Female distinguished by course of internal epigynal ducts (Fig. 22).

**Description.**—*Male:* ( $n = 5$ ). There is considerable variation in size of specimens. Total length 2.6–3.3 ( $\bar{x} = 2.90$ ), length of carapace 1.4–1.7 ( $\bar{x} = 1.52$ ), maximum carapace width 1.1–1.5 ( $\bar{x} = 1.28$ ), eye field length 0.8–1.0 ( $\bar{x} = 0.94$ ), eye row I width 0.9–1.2 ( $\bar{x} = 1.08$ ). Cephalothoracic integument dark chestnut brown with darkened area surrounding eyes III, covered with colorless thin adpressed scales, more intensely white scales form small white spots behind eyes III and a single median spot on posterior slope of the thorax; concentration of white scales along posterior part of the ventral rim of carapace. Abdomen brown with small anterior median dot of white scales, lateral whitish line around anterior half of abdomen at the edge of lateral surface, followed by two pairs of small white marginal round spots and very small and inconspicuous posterior whitish median chevrons; when dorsal setae become lost there appears a hardened dorsal integument, also brown. Frontal aspect brown, setae whitish, larger and more conspicuous than in *Bianor vitiensis* new species, setae surrounding eyes I entirely white; sparse longer setae overhanging cheliceral bases. Chelicerae brown, basally darker and with sparse white setae. One retrolateral cheliceral tooth, two prolateral cheliceral teeth. Pedi-



Figures 18–24.—*Bianor obak* new species, from Palau. 18, Dorsal surface, female; 19, Lateral view, female; 20, Epigynum; 21, Epigynum in latero-ventral view; 22, Internal structure of epigynum showing right spermatheca and ducts; 23, Palpal organ ventrally; 24, Palpal organ laterally.

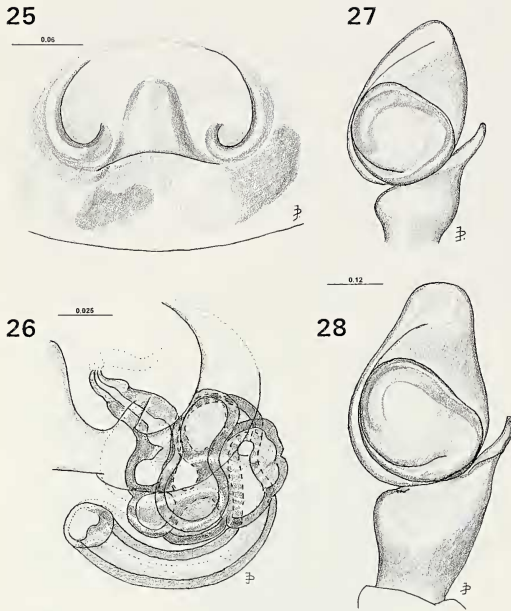
palps chestnut brown. *Legs*: Leg formula 1-4-3-2; patella-tibia I length 0.9–1.5 ( $\bar{x}$  = 1.18), lengths of patella-tibia III and IV equal. Ventral spines of tibia I: outer row = 3, inner row = 3. Leg I darker chestnut brown, femora II-IV dark greyish brown, patellae and tibiae II-IV with single median lighter yellow ring, metatarsi II-IV yellow with darker joints, tarsi II-IV yellow.

*Female*: ( $n$  = 5). Total length 3.4–4.5 ( $\bar{x}$  = 3.96), length of carapace 1.7–1.8 ( $\bar{x}$  = 1.74), maximum carapace width 1.4–1.6 ( $\bar{x}$  = 1.50), eye field length 1.0–1.1 ( $\bar{x}$  = 1.08), eye row I width 1.1–1.2 ( $\bar{x}$  = 1.18). Eyes I surrounded with fawn setae except white on the ventral part of AME's rim and on external lateral rim of ALE's. Clypeus with white setae, short and dense, a few long whitish setae overhang chelicerae, anterior surface of chelicerae covered with long but sparse whitish setae. Body covered with adpressed whitish setae, thoracic

slope almost vertical, begins immediately behind eye field. Carapace chestnut brown with darker lateral and anterior margins, scales on eye field colorless, more intensely white on thorax, slightly denser behind eyes III and above ventral edge of carapace. Cheliceral teeth as in male. Abdomen light brown with one pair of marginal white spots, surrounded by darker rims, and very indistinct lighter chevrons on posterior part of abdomen. *Legs*: Leg formula 1-4-3-2; patella-tibia I length 1.1–1.3 ( $\bar{x}$  = 1.24), patella-tibia III shorter than IV. Ventral spines of tibia I as in male. *Epigynum*: With narrow hood, semicircular rims, and complexly coiled ducts (Figs. 20–22).

*Material examined*.—CAROLINE ISLANDS: Palau, Angaur, scrub forest, 3♀, 27 April 1973 (JWB & JAB). Malakal, under rocks in field, 4♀4imm, 17 April 1973 (JWB & JAB). Malakal, grass field, sweeping, 6♀4imm, 18 April 1973





Figures 25–28.—*Bianor vitiensis* new species, from Fiji: Viti Levu. 25, Epigynum; 26, Internal structure of epigynum showing right spermatheca and ducts; 27, 28. Palpal organ ventrally from two specimens in the same sample.

(JWB & JAB). Peleliu, Chief Obak's yard, grass sweeping, 7♂6♀ (including holotype) 4imm, 23 March 1973 (JWB & ERB).

**Distribution.**—Known from three islands in the Palau group of the Caroline Islands.

*Bianor vitiensis* new species

Figs. 25–28, Map 2

**Holotype.**—Female from Fiji: Viti Levu, Tholo-i-Suva Forest Park, sweeping and shaking trees, 6 May 1987 (ERB) (BPBM).

**Etymology.**—Named for the island of Viti Levu (Great Fiji) in Fiji, at present the only known location for this species.

**Diagnosis.**—In male, setae surrounding AME white ventrally, orange dorsally and laterally. Anterior margin of palpal bulb truncate oblique to long axis of cymbium, embolus forming a somewhat distorted oval. Tibia longer and tibial apophysis shorter than in *B. obak* new species. Female distinguished by internal epigynal ducts (Fig. 26). The width of the epigynal hood is variable and not diagnostic in this or the preceding species.

**Description.**—*Male:* ( $n = 5$ ). Total length 3.4–5.4 ( $\bar{x} = 3.98$ ), length of carapace 1.6–

2.2 ( $\bar{x} = 1.82$ ), maximum carapace width 1.4–2.1 ( $\bar{x} = 1.64$ ), eye field length 1.0–1.5 ( $\bar{x} = 1.18$ ), eye row I width 1.1–1.7 ( $\bar{x} = 1.26$ ). No distinct color pattern. Carapace uniformly chestnut brown, with darker pigmentation surrounding eyes III. Ventral edge of carapace black, with a single row of adpressed, whitish scales. Eye field finely pitted, shiny, with inconspicuous, adpressed, colorless minute scales, as well as with small upright sparse dark setae. Abdomen elongate oval, uniform light brown, inconspicuously darker marginally, covered with shiny, inconspicuous, transparent, adpressed scales and short upright bristles and even shorter setae, widely spaced. Face chestnut brown with very thin inconspicuous whitish setae, much thinner than in *Bianor obak* new species; however, setae around eyes and at the clypeal edge are broader and more conspicuous, those surrounding AME laterally and medially are orange, ventrally contrasting white, dorsally less conspicuous whitish mixed with yellow ones, those surrounding ALE similar but with yellow setae ventrally without contrasting white. Clypeus narrow with sparse, widely spaced whitish scales, a single row of whitish longer setae, widely spaced, overhangs cheliceral bases. Chelicerae light brown, with sparse whitish setae on basal half of their anterior surface. One retrolateral cheliceral tooth, two prolateral cheliceral teeth. Pedipalps light greyish brown. *Legs:* Leg formula 1-4=3-2; patella-tibia I length 1.4–2.8 ( $\bar{x} = 1.84$ ), patella-tibia III and IV equal. Legs I are more intensely chestnut brown, legs II-IV light greyish brown with slightly darker femora, all segments without differentiated rings. Ventral spines of tibia I: outer row, 3; inner row, 3. Mouth parts, coxa I and sternum brown, coxae II-IV yellowish grey, abdomen grey with median area lighter.

*Female:* ( $n = 5$ ). Total length 4.4–5.8 ( $\bar{x} = 5.08$ ), length of carapace 1.7–2.2 ( $\bar{x} = 1.96$ ), maximum carapace width 1.7–1.9 ( $\bar{x} = 1.82$ ), eye field length 1.0–1.4 ( $\bar{x} = 1.24$ ), eye row I width 1.2–1.4 ( $\bar{x} = 1.34$ ). Carapace uniform dark chestnut brown, with only surroundings of eyes III and anterior edge darker pigmented, covered with short, adpressed white setae. Abdomen appears almost uniformly brownish or brownish-grey, with indistinct whitish setae. An indistinct pattern is seen in some specimens, of 2–3 lighter, whitish, diagonal lines

marginally, a median line of small whitish chevrons in the posterior half, and a darker median line along anterior half of abdomen. Lacks the pair (or pairs) of small dark-edged marginal white spots, which seem to be characteristic of *Bianor obak*. Dense band of white setae on clypeus delimits oval orange area on which eyes I are located, AME surrounded by orange and a few single white setae ventrally, ALE also surrounded by orange with a few white setae dorsally; there is a row of sparse white setae at the clypeus edge, overhanging chelicerae bases. Chelicerae brown with sparse whitish setae; pedipalps yellow with white setae. *Legs*: Leg formula 4-1=3-2; patella-tibia I length 1.2–1.8 ( $\bar{x}$  = 1.56), patella-tibia III and IV equal. Legs I brown. Legs II–IV brownish-greyish-yellow. Ventral side light brown, with mouth parts and sternum darker brown. Epigynum and its internal structure are shown in Figs. 25, 26.

**Material examined.**—**F.I.J.I.** *Viti Levu*, Namosi Dist., hill forest on Namosi road, about 7 km N of Queen's Rd., 19 May 1987, 2♀, (JWB & ERB). 3.4 km N of Queen's Road on Namosi Road, grassy meadow by stream, sweeping, 1♂4♀7imm, 7 May 1987 (JWB & ERB). 5 km E of Komave village, in coral rubble on beach, 1♀1imm, 24 May 1987 (JWB & ERB). Nandarivatu, pine/scrub forest beside guesthouse, sweeping/shaking, elev. 800 m, 1♀, 14 May 1987 (JWB & ERB). Nandarivatu, forestry station, sweeping, 1♀4imm, 12 April 1987 (JWB & ERB). 8–10 mi by King's Road N of Nausori, hill forest, on vegetation, 1♀, 19 May 1980 (JAB). 1.7 km S of Naimborembore (near Nausori), 1♀, 8 May 1987 (JAB). Hill forest about 8 miles NE of Navua, tree shaking, 1♀1imm, 2 May 1987 (JWB & ERB). Nausori, from shaking banana leaves, 7♂7♀10imm, 18 May 1987 (JWB & ERB). Tholo-I-Suva Forest Park, shaking & sweeping trees, 1♀ (holotype), 6 May 1987 (ERB). Nine km W of Suva, (W of Lami), cut over forest, 1♂1♀2imm, 23 May 1987 (JWB & ERB).

**Distribution.**—Known only from Viti Levu in Fiji.

#### Genus *Efate* Berland 1938

**Discussion.** The genus *Efate* was established by Berland (1938) for the single species *E. albobicinctus* from the New Hebrides (now Vanuatu), which was also later reported from Samoa (Marples 1955). Two additional species are described here.

**Diagnosis.**—Small-to-medium ant-like fissidentate salticids. The only similar genera in

the Pacific are *Rarahu* Berland 1929 and *Sobasina* Simon 1897. *Rarahu* differs from *Efate* by having leg spines only on metatarsus I. The male palp of *Efate* is of the euophryine type (Fig. 38), that of *Sobasina* is not. In the *Efate* epigynum the openings are widely separated (by more than their diameter) and the ducts short (Figs. 36, 37), *Sobasina* has openings close together and ducts long.

**Descriptive notes.**—Ant-like species of rather uniform appearance about 3–5 mm long. Carapace flattened, low, eye field occupying half of its length, lateral eyes on the edge of carapace, posterior eyes protruding somewhat. Eye field finely rough and shiny, covered with sparse, minute, colorless adpressed setae. An indistinct line of whitish setae behind eye field and a patch of longer whitish setae at the rear thoracic margin, on each side of the pedicel. Pedicel short but readily visible from above. Abdomen long, narrower than carapace, broadest just behind the middle, then narrowing posteriorly. Color pattern variable, either two white transverse lines on dark background or some light and dark areas, transverse areas or lines, related to that pattern. Clypeus obsolete, chelicerae small, their length equal to diameter of AME, broad, anterior surface flattened with distinct antero-lateral edge. Promarginal teeth two, basal one small, triangular, distal one wide and 3–4 cusped; retromarginal tooth fissidentate. *Legs*: Legs I have femur and tibia + patella enlarged, with tibia in some forms more strongly developed, compressed and swollen ventrally (more pronounced in females), but in males of *E. albobicinctus* not swollen. Tibia with 5–6 pairs of ventral spines; there is usually a ventral crest of two or more rows of long flattened dark setae, also not developed in males of some species (*E. albobicinctus*). *Palp*: Of generalized euophryine type with oval, moderately broad bulb, medium length tibial apophysis and shortened embolus, largely hidden dorsally to bulb, with only end of tip visible. *Epigynum*: With a pair of round openings, usually widely separated, leading to short ducts which open into nearly spherical seminal receptacles. A bell-shaped hood between openings except in *E. raptor* new species.

*Efate albobicinctus* Berland 1938  
Figs. 29–35, Map 3

*Efate albobicinctus* Berland 1938.

**Holotype.**—Male from New Hebrides, Efa-



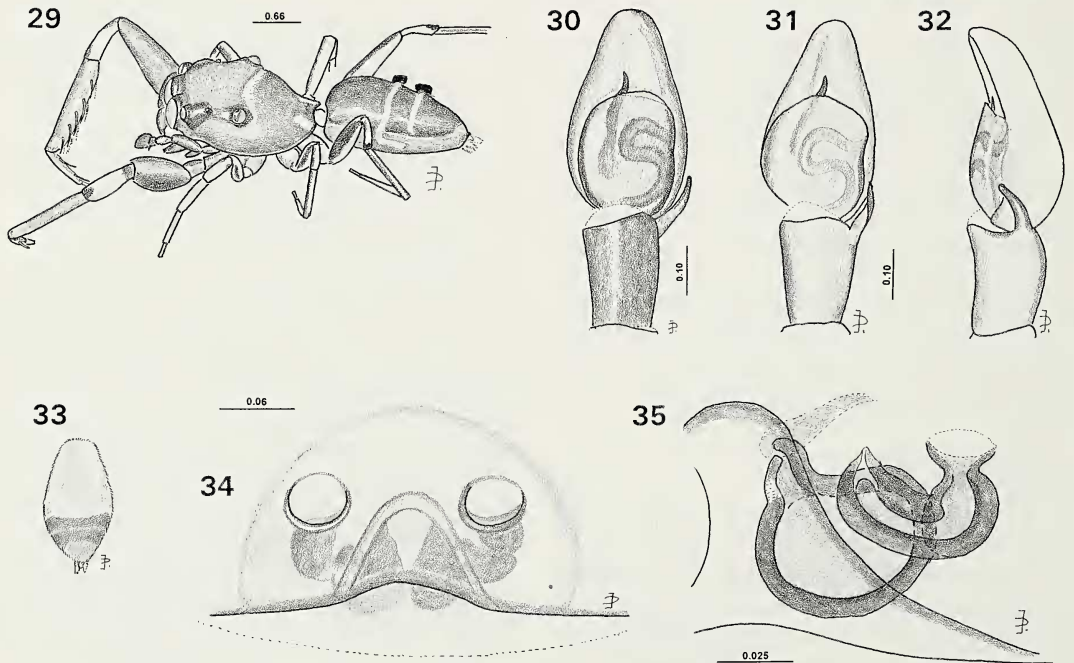


Map 3.—Distribution of *Efate albobicinctus* (\*), *Efate fimbriatus* new species (■), and *Efate raptor* new species (□).

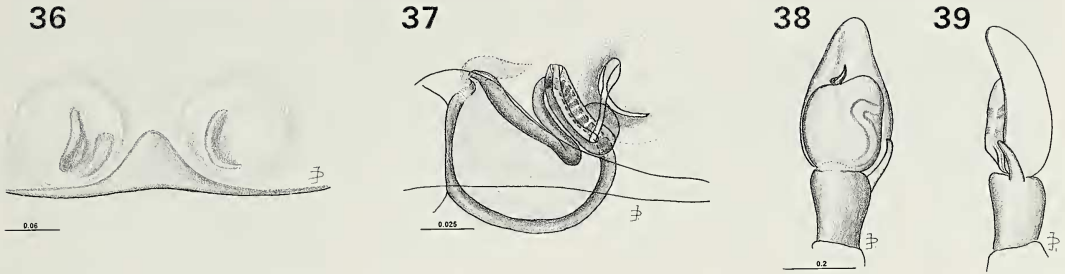
te, Apr.-May 1934, Coll. Aubert de la Rue, in MNHN, Paris, not seen.

**Description.**—*Male*: ( $n = 5$ ). Total length 3.5–4.2 ( $\bar{x} = 3.72$ ), length of carapace 1.6–2.0 ( $\bar{x} = 1.78$ ), maximum carapace width 1.1–

2.0 ( $\bar{x} = 1.56$ ), eye field length 1.0–1.1 ( $\bar{x} = 1.04$ ), eye row I width 1.0–1.2 ( $\bar{x} = 1.12$ ). Carapace dark brown, with lighter reddish brown band behind eye field. Abdomen with dark greyish brown scutum (only in this species of the genus) and striped grey sides. Spinnerets yellowish. Face dark brown; chelicerae brown. Pedipalps darker brown, legs I brown with patella and tarsus light yellow. Mouth parts, coxa I and trochanter I brown, sternum brown, darker marginally, coxae and trochanters II–IV light yellow, abdomen ventrally uniform dark greyish-brown. *Legs*: Leg formula 1-4-3-2; patella-tibia I length 1.4–2.0 ( $\bar{x} = 1.60$ ), patella-tibia III shorter than IV. Legs I with coxa, trochanter and femur dark brown, patella yellow, dorsally with dark brownish-grey basal end and apical spot; tibia I light brown with a spot of whitish setae prolatero-dorsally near apical end, with five pairs of ventral spines, but no ventral crest of setae; tibia cylindrical, slightly compressed; metatarsus dorsally light brown, laterally darker brown, with three pairs of long ventral spines, tarsus yellow. Legs II–IV yellow, with dark brown prolateral surfaces of femora II–III,



Figures 29–35.—*Efate albobicinctus*. 29, General appearance of male; 30, Palpal organ ventrally of male from Ponape; 31, Palpal organ ventrally of male from Ponape; 32, Palpal organ of male from Fiji; 33, Abdominal pattern of male from Fiji; 34, Epigynum of female from Fiji; 35, Internal structure of epigynum showing single spermatheca and ducts, from Fiji.



Figures 36–39.—*Efate fimbriatus* new species. 36, Epigynum, female from Caroline Islands; 37, Internal structure of epigynum of female from Caroline Islands; 38, Palpal organ ventrally from Caroline Islands; 39, Palpal organ, laterally, from Marshall Islands.

prominent dark brown lines prolaterally along tibiae II–IV, two dark spots prolaterally on patellae II–IV and a dark spot apically on dorsal surface of patella IV; there are dark lines retrolaterally on tibia IV (prominent), metatarsus IV (indistinct) and on femur II (thin, in basal part only). *Palp*: Embolus short, palp virtually indistinguishable from *E. fimbriatus* new species; see Figs. 30–32.

*Female*: ( $n = 3$ ). Total length 4.5–4.7 ( $\bar{x} = 4.60$ ), length of carapace 1.9–2.0 ( $\bar{x} = 1.93$ ), maximum carapace width 1.2 ( $\bar{x} = 1.20$ ), eye field length 1.1–1.2 ( $\bar{x} = 1.13$ ), eye row I width 1.1–1.2 ( $\bar{x} = 1.17$ ). Carapace yellow with eye field anteriorly darker; line of whitish setae behind eye field and hind marginal spots more obvious than in male. Abdomen anteriorly light, whitish, posterior third of abdomen, behind second white line, grey. Spinnerets whitish. Face and chelicerae light chestnut brown; pedipalps yellow. Mouth parts light brown to yellowish-brown, sternum whitish-yellow, coxae and trochanters I–IV whitish, abdomen whitish. *Legs*: Leg formula 4-1-3-2; patella-tibia I length 1.4 ( $n = 1$ ), patella-tibia III shorter than IV. Femur and tibia laterally yellowish light brown, patella and apical end of tibia I whitish, metatarsus and tarsus yellow. Leg I femur yellow, patella whitish, tibia brownish-yellow, apically with whitish ring, with five pairs of ventral spines and ventral crest of setae, width of tibia I 40% of its length; metatarsus yellow with three pairs of long ventral spines, tarsus yellow. Legs II–IV whitish, with greyish pigmented line apically on prolateral surface of femur IV. Prolateral surfaces of femur III and tibia IV yellow; remaining segments whitish. *Epigynum*: hood short but narrower than in *E. fimbriatus* new species, extends over half of each spermathe-

ca, curve of sclerotized duct developed more posteriorly, spermatheca globular and smaller than in *E. fimbriata* (Figs. 34, 35).

**Material examined.**—**CAROLINE ISLANDS:** *Ponape*, Kolonia, in building, 1♂, 28 March 1980 (JAB). Kolonia, on and in buildings, 1♂, 27 March 1980 (JAB). East of Kolonia palm forest, elev. 200 ft., 2♂ 1imm., 5 June 1973 (JAB & JWB). Kolonia, 1♂ 1♀, 3 June 1950 (P.A. Adams) (BPBM). Jokej, 1♀ 1imm, 10 January 1953 (J.F.G. Clarke) (BPBM). *Yap*, Fedor Village, forest, tree shaking, 3♂, 31 January 1980 (JWB). Gilman, coconut undergrowth, 1♂, 29 May 1973. (JAB & JWB). *Truk*, Moen Is., mixed forest above quarry, shaken from trees, 3♂9♀ 17imm., 12 June 1973 (JAB & JWB). Moen, S Slope of Mt. Tonaachau, 1♀, 2 April 1949 (R.W.L. Potts) (BPBM). *Kusaie*, Hill 750, 230 m, 1♀, 25 February 1953 (J.F.G. Clarke) (BPBM). **FIJI:** *Viti Levu*, N of Singatoka, sweeping & shaking along river, 3♂ 1♀ 21imm., 21 May 1987 (JWB & ERB). Near Mbau, under stones and swept on dry slope, 5♂ 3♀ 4imm, 9 July 1958 (B.J. Marples). Ovalau, Wai-ni-loka, 2♀, 11 July 1938 (L. Berland) (BPBM). **MARIANA ISLANDS:** *Guam*, Mt. Alifan, 1♀, August 1952 (N.L.H. Krauss) (BPBM). **NEW HEBRIDES:** *Santo I.*, Big Bay, elev. 0–30 m, 5♂, 16 September 1979 (W.C. Gagne) (BPBM). **SOLOMON ISLANDS:** *Tulagi*, 1♀, 17 July 1934 (BMNH).

**Distribution.**—New Hebrides, Caroline Islands, Guam, Fiji.

*Efate fimbriatus* new species  
Figs. 36–39, Map 3

**Holotype.**—Male from Marshall Islands, Kwajalein Atoll, Gugegu Island, shaken from trees, 24 July 1969 (JWB) (BPBM).

**Etymology.**—The name *fimbriatus*, fringed, refers to the presence of the ventral fringe of dark setae on the first tibia in both sexes of this species.



**Diagnosis.**—Differs from the other two species of the genus by proportions of epigynum and palpal organ (Figs. 36–39); tibia I compressed and with ventral setal crest in both sexes, color pattern light.

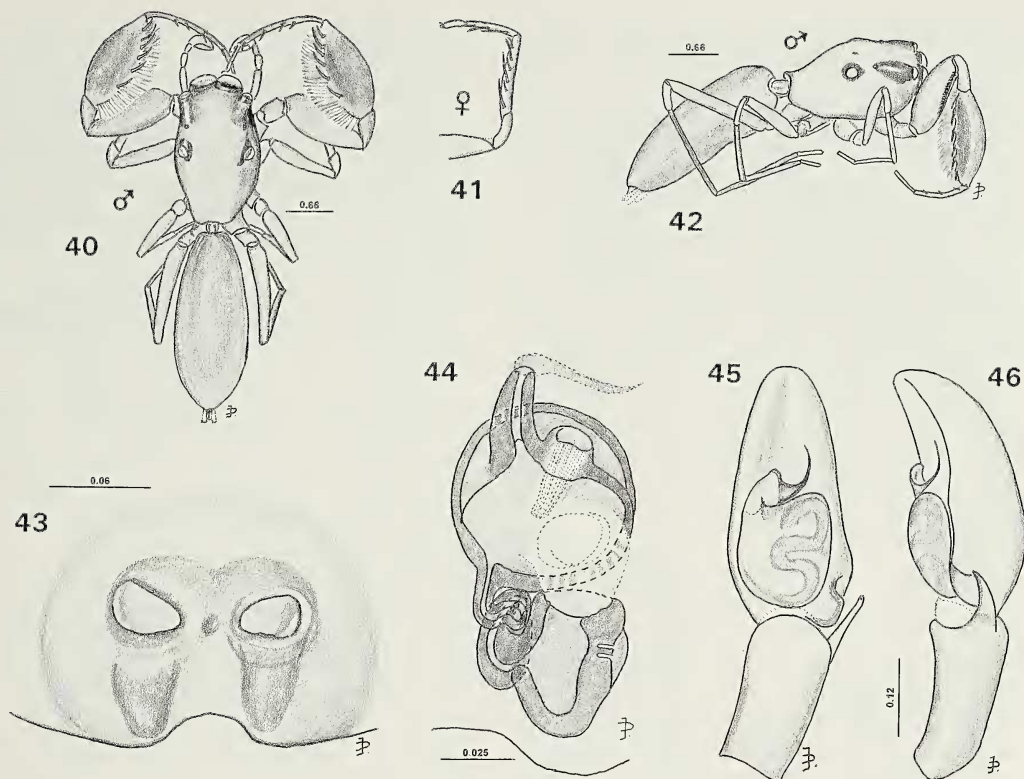
**Description.**—*Male:* ( $n = 3$ ). Total length 3.6–4.8 ( $\bar{x} = 4.37$ ), length of carapace 1.8–2.4 ( $\bar{x} = 2.20$ ), maximum carapace width 1.1–1.6 ( $\bar{x} = 1.43$ ), eye field length 1.0–1.4 ( $\bar{x} = 1.13$ ), eye row I width 1.1–1.5 ( $\bar{x} = 1.33$ ). Carapace light brown, posteriorly lighter, eye field darker brown, with a small oval depression in the foveal area and more prominent bulge just behind it, remnants of line of white setae behind eye field practically invisible. Abdomen with soft integument, olive grey in preservative, anteriorly lighter, with anterior line of white setae obvious but not contrasting. Posterior with indistinct white line in the form of a sparse row of whitish setae, abdomen covered with short brown setae, spinnerets whitish. Face fawn; chelicerae yellowish-fawn. Pedipalps with femur greyish-brown, patella, mouth parts, coxa I and trochanter I brownish yellow, sternum greyish-yellow marginally, coxae and trochanters II–IV whitish, abdomen ventrally uniform light greyish-olive. *Legs:* Leg formula 1-4-3=2; patella-tibia I length 1.6–2.8 ( $\bar{x} = 2.27$ ), patella-tibia III shorter than IV. Legs I light brown with whitish spots laterally on patella and apically on tibia I, metatarsus dorsally whitish-yellow, laterally darker yellow, tarsus whitish-yellow. Leg I coxa, trochanter, femur, patella and tibia brownish-yellow, patella with whitish spot prolaterally; tibia I apically with narrow whitish ring, with five pairs of ventral spines and ventral crest of greyish setae, width of tibia about 33% of length of segment; metatarsus laterally brownish-yellow, dorsally and ventrally whitish, tarsus I whitish. Legs II–IV whitish, with brown prolateral surface of femur IV, femora II–III with a prolateral brown line; thinner prolateral brown lines run along tibiae II–IV and retrolaterally on tibia IV. Also a weak dark spot apically on patella IV; remaining segments whitish. *Palp:* Tibia greyish-yellow, cymbium light fawn with whitish anterior part; loop of the seminal receptacle in bulb tighter, narrower (Figs. 38, 39).

*Female:* ( $n = 4$ ). Total length 4.2–5.0 ( $\bar{x} = 4.60$ ), length of carapace 2.0–2.2 ( $\bar{x} = 2.08$ ), maximum carapace width 1.2–1.4 ( $\bar{x} = 1.30$ ), eye field length 1.1–1.2 ( $\bar{x} = 1.15$ ), eye row

I width 1.2–1.3 ( $\bar{x} = 1.25$ ). Larger than male, more similar to male of *E. albobicinctus*. Carapace uniform brown, a line of white setae behind eye field and white spots at thoracic hindmargin. Abdomen with soft integument, posteriorly brownish-grey, antero-medially yellowish-grey, with anterior whitish line barely visible, the posterior white line sometimes not visible; abdomen covered with short and very sparse colorless setae. Spinnerets whitish. Face chestnut brown; chelicerae brownish; pedipalps greyish-brown with lighter tip of the tarsus; legs I light brown with lighter apical end of tibia I, metatarsus and tarsus light brownish-yellow. Mouth parts, coxa I and trochanter I brownish-yellow, sternum brown, coxae and trochanters II–IV whitish, abdomen ventrally uniform light grey with olive hue. *Legs:* Leg formula 4=1-3-2; patella-tibia I length 1.6–1.8 ( $\bar{x} = 1.68$ ), patella-tibia III shorter than IV. Leg I coxa, trochanter, femur, patella and tibia light brown, patella with indistinct lighter spot prolaterally; tibia I apically with narrow whitish yellow ring, with five pairs of ventral spines and ventral crest of greyish flattened setae; tibia I width 37% of its length; metatarsus light brownish-yellow, with three pairs of long ventral spines; tarsus yellow. Legs II–IV whitish, with brown prolateral surface of femora III–IV, prolateral brown line on femur II; thinner prolateral brown lines run along tibiae II–IV and retrolaterally on tibia IV; also a weak dark spot apically on patella IV; remaining segments whitish. *Epigynum:* hood short and broad, extends over the whole spermathecae, bend of sclerotized channel developed rather anteriorly, spermatheca more transverse oval and broader than in remaining species (Figs. 36, 37).

**Material examined.**—**CAROLINE ISLANDS:** *Kusaie*, Lelu I., beating, 100 m, 1♂1♀, 12 March 1953 (J.F.G. Clarke)(BPBM). **MARSHALL ISLANDS:** *Kwajalein Atoll*, Gugegu Island, shaken from trees, 1♂(holotype)1♀3imm, 24 July 1969 (JWB). *Majuro Atoll*, Majuro Isl., shaken from trees coconut-breadfruit community, 2♂2♀6imm., 2 August 1969 (JWB). *Arniel Island*, shaken from trees in coconut-*Pandanus* forest, 1♀1imm., 1 August 1969 (JWB).

**Distribution.**—Known only from the Caroline and Marshall Islands.



Figures 40–46.—*Efate raptor* new species, from Fiji. 40, Dorsal appearance of male; 41, Tibia of female; 42, Lateral appearance of male; 43, Epigynum; 44, Internal structure of epigynum showing right spermatheca and ducts; 45, Palpal organ, ventrally; 46, Palpal organ, laterally.

*Efate raptor* new species

Figs. 40–46, Map 3

**Holotype.**—Male from Fiji, Viti Levu, Lami on tree in field 23 May 1987 (JWB & ERB) (BPBM).

**Etymology.**—The name is a noun in apposition based on the raptorial appearance of the first legs of the male.

**Diagnosis.**—The raptorial appearance of the first legs, fringe of setae on first tibia and long embolus distinguish the male. In the female the slender first tibia without setal fringe and the position of the epigynal openings ventral to the spermathecae rather than lateral to them are distinctive.

**Description.**—Both sexes similarly shaped. Abdomen elongate oval. Carapace with eye field flat, posterior slope begins shortly behind, no thoracic constriction. Rugosity of eye field so minute as to be practically invisible, profile of carapace slightly different from other species, with thoracic slope beginning just

behind the eye field, without any intermediate depression, and sloping diagonally, gently and without any incipient bulge; no transverse lines of whitish setae nor whitish spots at the end of thorax. Pedicel short.

**Male:** ( $n = 2$ ). Total length 3.8, 4.5; length of carapace 1.8, 1.9; maximum carapace width 1.0, 1.2; eye field length 1.0, 1.1; eye row I width 0.9, 1.1. Eyes aligned along their dorsal rims, ALE's diameter  $\frac{1}{2}$  of AME, clypeus very low, bare, chelicerae short. First eye row surrounded by thin and very sparse colorless setae; with no contrasting marks. Three stout curved median bristles below AME: two near clypeus edge and one slightly above. Abdomen grey. **Legs:** Leg formula 4-1-3-2; patella-tibia I length 1.5, 1.9; patella-tibia III length shorter than IV. Legs I brown, legs II-IV light brownish-grey. Femur I fawn, ventro-retrolateral edge with a dense row of short, stout black setae opposing corresponding row of setae on tibia. Tibia I compressed but ex-



panded dorso-ventrally and rounded, making an oval plate, with dorsal surface slightly flat and with distinct dorso-lateral edges, lateral surfaces dark brown, dorsal and ventral surfaces lighter. Tibia I width 41% of its length; six pairs of ventral spines; a thin crest of dense flattened setae, dark and long, on pro-lateral side of femur. Metatarsus I thin and long, with short but robust ventral spines (four prolateral and three retrolateral). *Palp*: Typically euophryine, with meandering seminal receptacle canal and thin, anterior embolus, twisted into a coil, in this species making only half a circle (Figs. 45, 46). Cymbium twice as long as the bulb, and slightly longer than tibia; tibial apophysis slim and short, straight in ventral view, but laterally appears half-crescent shaped.

*Female*: ( $n = 5$ ). Total length 4.6–5.0 ( $\bar{x} = 4.72$ ), length of carapace 1.8–2.0 ( $\bar{x} = 1.88$ ), maximum carapace width 1.0–1.2 ( $\bar{x} = 1.12$ ), eye field length 1.0–1.2 ( $\bar{x} = 1.10$ ), eye row I width 1.0 ( $\bar{x} = 1.00$ ). Ventral aspect generally pale, whitish-yellow. *Legs*: Leg formula 4-1-3-2; patella-tibia I length 1.5–1.6 ( $\bar{x} = 1.56$ ), patella-tibia III length shorter than IV. Leg I pale yellow, with some greyish darkening. Abdomen light-grey divided by white line, accented by a white transverse line in the dorsal depression, on sides turning diagonally. Tibia I cylindrical, with flattened dorsal surface, six pairs of ventral spines but no ventral crest of setae. Width of femur I 36% of its length, tibia I 16%. Femur I without row of strong setae along retro-lateral edge, but some indistinct and sparse setae along that edge. *Epigynum*: consists of a pair of large but indistinct openings located on the background of translucent spermathecae; internal structures consist of two sclerotized chambers followed by a heavily sclerotized, short convoluted duct, leading into a spherical spermathecae. Pores are in two separate parts, also found in other Euophryinae: a distinct funnel-like structure near fertilization canal at the spermathecae producing a tight group of hair-like structures reaching center of spermathecae; also a porous structure (without actual opening visible) in wall of sclerotized entrance chamber.

**Material examined**.—**FIJI**: *Viti Levu*, Lomavuna district, about 3 km N of Nanggali, tree shaking in pine, 1♂2♀, 30 May 1987 (JWB & ERB). Lami (near Suva), tree in field, 1♂(holo-

type)1♀ limm, 23 May 1987 (JWB & ERB). Nausori Highlands, 500–700 m, 1♂, November 1976 (N.L.H. Krauss) (BPBM). Mbau District at C.A.T.D. campus stream, near Mbau Landing, 3♀, 31 May 1987 (JWB & ERB). Hill forest 8 miles NE of Navua, tree shaking, 1♀, 2 May 1987 (JWB & ERB). Nanduri Village, shaking shrubs on hill side; elev. 100 ft., 1♀, 21 May 1987 (JWB & ERB). *Ovalau*, Levuka, 1♂, December 1969 (N.L.H. Krauss) (BPBM).

**Distribution**.—Known only from the islands of Viti Levu and Ovalau in Fiji.

#### Genus *Ergane* L. Koch 1881

**Discussion**.—This genus currently includes three species (Prószyński 1990): *E. cognata* L. Koch 1881, known only from the type specimen from the Pellew Islands, Australia (Davies & Żabka 1989), *E. insularis* L. Koch 1881, from Pellew Islands (type missing from the Hamburg Museum which has the types of Koch's other *Ergane* species (Rack 1961)), and *E. benjarei* (Peckham & Peckham 1907), from Sarawak, Borneo, type location unknown to us. These species are all said to have the ocular quadrangle wider behind than in front (Davies & Żabka 1989; Peckham & Peckham 1907; Simon 1901–03). The new species described here has the ocular quadrangle narrower behind. It otherwise closely resembles figures of *E. cognata* in Davies & Żabka (1989).

**Diagnosis**.—A large fissidentate salticid with lateral spines on metatarsus I, anterior coxae separated by more than a coxal diameter, retromarginal cheliceral tooth tricuspid, promarginal tooth bicuspid.

#### *Ergane carinata* new species

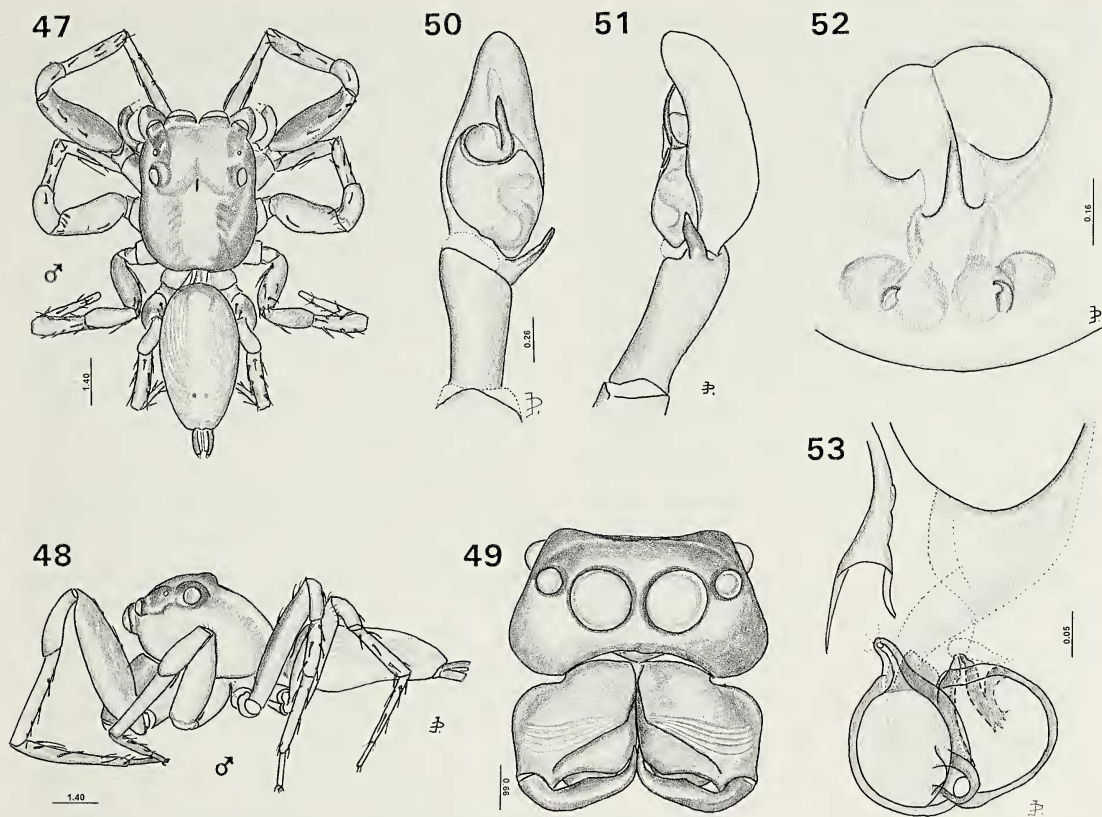
Figs. 47–53

**Holotype**.—Male from Caroline Islands, Palau, Arakabesan Island, 23 March 1973 (JAB & JWB) (BPBM).

**Etymology**.—The name, *carinata*, refers to the distinctive ridges on the anterior face of the male chelicerae.

**Diagnosis**.—Male palp typically euophryine with relatively broad embolus, chelicerae broad and diverging, with diagonal ridges in their anterior apical part; female epigynum with two oval windows located far anteriorly. Retrolateral cheliceral tooth tricuspid.

**Description**.—*Male*: ( $n = 5$ ). Total length 7.8–10.3 ( $\bar{x} = 9.06$ ), length of carapace 3.5–4.8 ( $\bar{x} = 4.13$ ), maximum carapace width 2.8–



Figures 47–53.—*Ergane carinata* new species from Palau (Caroline Islands). 47, Dorsal appearance of male; 48, Lateral appearance of male; 49, Face of male; 50, Palpal organ ventrally; 51, Palpal organ laterally; 52, Epigynum; 53, Internal structure of epigynum showing right spermatheca and duct.

3.8 ( $\bar{x}$  = 3.34), eye field length 1.8–2.2 ( $\bar{x}$  = 2.02), eye row I width 2.3–2.8 ( $\bar{x}$  = 2.53). Carapace dark brown, with light median streak along thorax, black lateral and anterior edges of the eye field, eyes III risen half of their diameter above eye field, dorsum of carapace gently rounded, the highest point just before eyes III, sloping posteriorly from there. Abdomen narrower than carapace, elongate and pointed posteriorly, with dorsal surface and upper sides with dense dark greyish brown lines, separated by chains of yellowish dots; there is a yellowish-white median streak, narrowed in two places; spinnerets thin and elongate, dorsally dark, ventrally light. Dorsal edges of ALE are positioned slightly above AME, their diameter about half of the AME. Chelicerae broad and diverging, anterior surfaces flattened, with several peculiar diagonal ridges in their apical part; fangs very large. One (3-cusped) retrolateral cheliceral tooth, one prolateral cheliceral tooth (2–3 cusped;

3rd cusp, when present, tiny). Fang furrow with a slight depression for reception of tooth. Chelicerae, endites and coxae I posteriorly dark chestnut brown. Lower external part of carapace appears swollen and rounded, somewhat resembling *Ascylltus pterygodes* (L. Koch 1865). Sternum and remaining coxae yellow, abdomen ventrally lighter yellow with darker, greyish median area. *Legs*: Leg formula 1-2-4-3; patella-tibia I length 3.4–5.2 ( $\bar{x}$  = 4.54), patella-tibia III longer than IV. Legs not particularly robust, segments beyond coxae brownish-yellow, legs II-IV yellow to brownish-yellow, with darker femora and darker annuli on tibiae. Numerous long spines, on tibiae I-IV in two rows on lateral surfaces, which resembles *Ascylltus*. There are other short setae on the legs, particularly ventrally on leg I, but less striking than in *Ascylltus*. *Palp*: Pedipalps thin, their femora bent, tibia long; embolus differs from *Ascylltus* Karsch 1878 by having a broad, flattened



shape; otherwise, these organs are rather similar in shape and proportions.

**Female:** ( $n = 5$ ). Total length 6.7–8.6 ( $\bar{x} = 7.76$ ), length of carapace 3.1–3.9 ( $\bar{x} = 3.64$ ), maximum carapace width 2.4–3.0 ( $\bar{x} = 2.73$ ), eye field length 1.7–1.9 ( $\bar{x} = 1.81$ ), eye row I width 2.0–2.4 ( $\bar{x} = 2.25$ ). Chelicerae differ from male by having normal proportions and shape; much lighter, yellowish coloration with darker areas in the same pattern as male. Face similar to male, but cheeks less pronounced. **Legs:** Legs much shorter than in male and uniformly yellow, but location and number of spines similar. Leg formula 4-1-3-2; patella-tibia III longer than IV. Patella-tibia I length 2.1–2.8 ( $\bar{x} = 2.52$ ). **Epigynum:** With two large rounded windows anteriorly, behind are a pair of bilobed spermathecae.

**Material examined.**—CAROLINE ISLANDS: Palau, Angaur, in *Triumfetta* litter, 1♀, 27 April 1973 (JAB, JWB, ERB). Angaur, mixed tropical forest, tree shaking, 1♀ imm., 30 April 1973 (JWB, ERB & JAB). Angaur, banana-betel palm forest, 5♂3♀5imm., 27 April 1973 (JWB, ERB & JAB). Arakabesan, 1♂ (holotype)1♀, 23 March 1973 (JWB, JAB). Arakabesan, mixed tropical forest, 1♀, 16 March 1973 (JWB & JAB). Koror, taro patch on shrubs, 2♂2♀, 2 April 1973 (JWB & JAB). Koror, taro patch, 4♂1♀3imm., 7 March 1973 (JWB & JAB). Koror, mangrove-taro, sweeping, 1♂, 31 January 1973 (JWB & ERB). Koror, banana-almond forest, near museum bai, hand collected, 2♂ imm., 31 January 1973 (JWB & ERB). Koror, vacant lot near bai, 2♂2♀, 25 March 1973 (JWB). Koror, vacant lot, 1♂1♀2imm., 22 March 1973 (JWB). Koror, scrub forest in vacant lot, sweeping, 2♂3imm., 14 May 1973 (JWB & JAB). Koror, scrub forest in vacant lot, tree shaking, 2♂, 13 February 1973 (JWB). Koror, scrub forest in vacant lot, sweeping, 3♂4imm., 13 March 1973 (JWB & JAB). Koror, laboratory building, 1♀ imm., 26 February 1973 (JWB). Koror, on laboratory building, 1♂1♀, 8 March 1973 (JAB). Koror, laboratory building, 2♀, 6 March 1973 (JWB). Koror, cave entrance, 1♂1♀ imm., 17 March 1973 (JWB & JAB). Babelthuap, Ngaremlengui, in woods, 2♂3♀2imm., 21 April 1973 (JWB, ERB & JAB). Babelthuap, Nekkin, open eucalyptus forest, sweeping and tree shaking, 2♀ imm., 3 February 1973 (JWB & ERB). Babelthuap, Airai, below SDA school, mixed tropical forest, tree shaking, 1♂1♀1 imm., 11 March 1973 (JWB, ERB & JAB). Babelthuap, Airai, betel palm forest, 1♀ imm., 11 March 1973 (JWB, ERB & JAB).

**Distribution.**—Known only from Palau in the Caroline Islands.

Genus *Euophrys* C.L. Koch 1834

**Discussion.**—This large, primarily Holarctic genus includes also some species of sub-Saharan Africa, Central and South America and southern Asia. It is absent from Australia (Davies & Žabka 1989) and has not previously been reported from anywhere in the Pacific region except Japan and New Zealand.

We have several very small species with similar external appearance but differing in length of embolus and internal structure of the epigynum. Logunov et al. (1993) recently questioned the diagnostic value of the epigynum and its internal structure for some species.

**Diagnosis.**—Small, usually unidentate non-antlike salticids, lacking lateral spines on tibia I. Fourth legs longer than others, but all legs relatively short and not differing very much in length. The carapace is short and high, with the cephalic region longer than thoracic region (Fig. 54). Second row of eyes midway between first and third rows.

**Descriptive notes.**—The species described here are characterized by minute size, high and broad carapace, with more than half of its length occupied by the eye field, the flat surface of the carapace making up  $\frac{1}{4}$  of its length, and the posterior slope of thorax very steep. Abdomen usually shorter and narrower than carapace, except in females. Anterior eyes in a straight row, aligned along their dorsal rims; ALE's diameter  $\frac{2}{3}$  of AME's, clypeus low,  $\frac{1}{6}$  of AME's diameter. Chelicerae small—equal to AME's diameter. Clypeus almost bare, with three bent bristles under junction of AME. Cheliceral dentition variable: in *Euophrys wanyan* new species and *Euophrys kororensis* new species there is a bicuspid (fissidentate) retromarginal tooth. In *Euophrys bryophila* new species there is a single cusp retromarginal tooth, as in Palaearctic species.

*Euophrys wanyan* new species

Figs. 54–58, Map 4

**Holotype.**—Male, from Yap Island, Wanyan, dead coconut fronds, 17 April 1980 (JAB & JWB) (BPBM).

**Etymology.**—The name *wanyan* is a noun in apposition after the village of Wanyan, Yap, where the specimens were collected.

**Diagnosis.**—Embolus making half-coil, narrower than in *Euophrys kororensis*, sclerotized duct in epigynum short, its width about  $\frac{1}{3}$  of diameter of spermatheca.

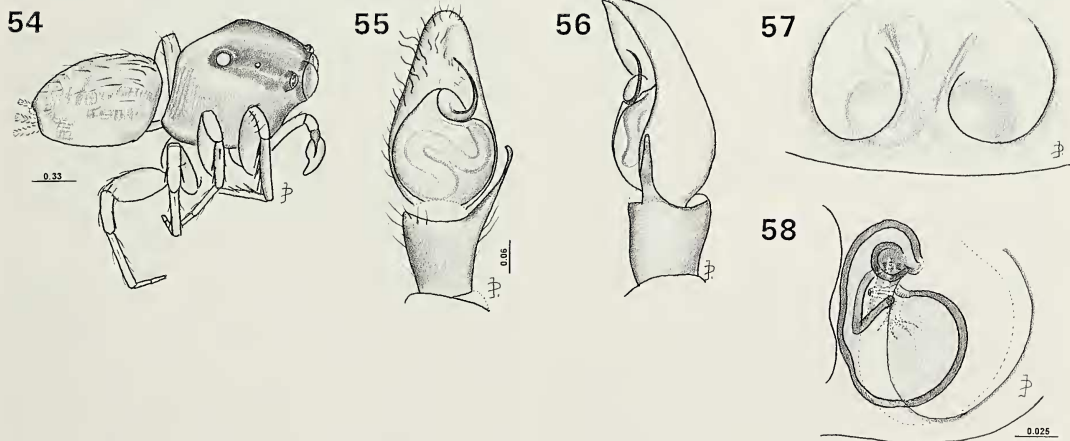


Map 4.—Distribution of *Euophrys wanyan* new species (★) from the Yap Islands, *Euophrys kororensis* new species (■) from the Palau Islands, and *Euophrys bryophila* new species (□) from Fiji.

**Description.**—*Male:* ( $n = 5$ ). Total length 2.4–2.6 ( $\bar{x} = 2.47$ ), length of carapace 1.2–1.4 ( $\bar{x} = 1.28$ ), maximum carapace width 0.9–1.0 ( $\bar{x} = 0.94$ ), eye field length 0.8 ( $\bar{x} = 0.80$ ), eye row I width 0.9–1.0 ( $\bar{x} = 0.96$ ). Small area on anterior of thorax, narrow streak below lateral eyes and narrow streak along lower sides whitish-yellow, posterior slope of thorax and major part of middle sides brown with some vertical darker lines. A dark streak along the ventral edge; eye field dark grey, lateral edges of eye field blackish, with remnants of

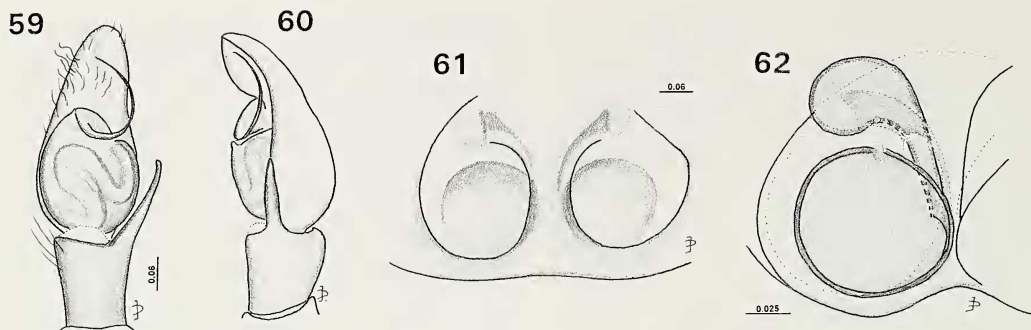
inconspicuous fine whitish setae above eyes I. A few sparse colorless setae around margins of eye field; otherwise, carapace almost bare. Abdomen light grey, minutely light yellowish spotted, anterior dorsal half lighter yellow suffused with grey, the posterior half with an indistinct pattern of light transverse lines; lower sides whitish, upper sides with mosaic of indistinct darker and lighter areas. Face light yellowish-brown, suffused with grey, contrasting with dark eye field; chelicerae yellowish-brown suffused grey, pedipalps yellow. One retrolateral cheliceral tooth, two prolateral cheliceral teeth. Setae surrounding eyes I inconspicuous whitish; clypeus bare with darker edge. Ventral aspect generally light yellow and whitish; chelicerae light brownish yellow, with a fissidentate bicuspid tooth on retrolateral edge. *Legs:* Leg formula 4=3-2-1, patella-tibia III length equal to IV. Patella-tibia I length 0.8 ( $\bar{x} = 0.80$ ). Ventral spines of tibia I: outer row, 3; inner row, 3. Metatarsus I with three pairs of long ventral spines (the basal one reaching middle of tarsus) and two pairs of shorter lateral spines, tibia I retrolaterally with five ventral spines and one lateral, prolaterally with three ventral spines and two lateral. *Palp:* Bulb broad oval, with coil of embolus anteriorly, embolus long, making a half-turn, unusual waving hairs antero-laterally on cymbium, apophysis long and thin, slightly bent apically.

*Female:* ( $n = 5$ ). Total length 3.0–3.3 ( $\bar{x} =$



Figures 54–58.—*Euophrys wanyan* new species, from Caroline Islands: Yap Island. 54, General appearance of male; 55, Palpal organ ventrally; 56, Palpal organ laterally; 57, Epigynum; 58, Internal structure of epigynum, showing single spermatheca and ducts.





Figures 59–62.—*Euophrys kororensis* new species, from Caroline Islands: Palau. 59, Palpal organ ventrally; 60, Palpal organ laterally; 61, Epigynum; 62, Internal structure of epigynum --single spermatheca and ducts.

3.12), length of carapace 1.3–1.5 ( $\bar{x}$  = 1.40), maximum carapace width 1.0–1.2 ( $\bar{x}$  = 1.10), eye field length 0.8–0.9 ( $\bar{x}$  = 0.71), eye row I width 1.0–1.1 ( $\bar{x}$  = 1.08). Cheliceral teeth as in male. *Legs*: Leg formula 4-3=1-2, patella-tibia III length about equal to IV Patella-tibia I length 0.9–1.1 ( $\bar{x}$  = 1.00). Ventral spines of tibia I: outer row, 5; inner row, 4. *Epigynum*: With transverse oval membranous window, spermathecae relatively small, sclerotized copulatory duct short, membranous duct inconspicuous and short, directed back (Figs. 57, 58).

**Material examined.**—CAROLINE ISLAND: Yap, Wanyan, dead coconut fronds, 1♂(holotype)2♀, 17 April 1980 (JAB & JWB). Gilman Point, 1♂, beach litter, 1♀, coconut undergrowth, 29 May 1973 (JWB & JAB). Gilman Point, 1♂, sweeping low vegetation; 2♀, among dead coconut fronds; 2♂1♀, beach litter, 15 April 1980 (JWB & JAB). Fedor, under rocks, 1♀, 6 April 1980 (JWB & ERB). Fedor, under rocks, 1♂, 9 April 1980, (JAB & JWB). Fedor, coconut trash, 1♀, 7 February 1980 (JAB & JWB). Aringel, 1♀, tree shaking, 3 March 1980 (JWB & JAB). Map, Chool, 1♀, ♂, on coconut trunk, 12 April 1980 (JAB & JWB).

**Distribution.**—Known only from Yap in the Caroline Islands.

*Euophrys kororensis* new species  
Figs. 59–62, Map 4

**Holotype.**—Male from Caroline Islands, Palau, Koror Island, litter at edge of taro patch, 2 April 1973 (JWB & JAB) (BPBM).

**Etymology.**—The species name, *kororensis*, is after the island of Koror, Palau, where the specimens were collected.

**Diagnosis.**—Embolus making half-coil,

broader than in *Euophrys wanyan*, sclerotized duct in epigynum short, its width about  $\frac{1}{8}$  of diameter of spermatheca.

**Description.**—*Male*: ( $n$  = 5). Total length 2.3–2.6 ( $\bar{x}$  = 2.42), length of carapace 1.2–1.3 ( $\bar{x}$  = 1.24), maximum carapace width 0.9–1.0 ( $\bar{x}$  = 0.98), eye field length 0.8–0.9 ( $\bar{x}$  = 0.82), eye row I width 0.9–1.1 ( $\bar{x}$  = 1.02). Anterior part of thorax, narrow streak below lateral eyes and lower sides whitish-yellow, posterior slope of thorax and middle sides brown with some vertical darker lines: there is a very thin dark line along the ventral edge. Eye field dark grey with lateral edge of eye field blackish. One retrolateral cheliceral tooth, two prolateral cheliceral teeth. Abdomen light grey dorsally, minutely light yellowish spotted in the posterior half with a few light transverse lines, one in the form of a slightly broader chevron; sides conspicuously whitish. Face light, yellow suffused, grey under AME, contrasting with dark eye field; chelicerae yellow suffused, pedipalps yellow. Ventral aspect generally light yellow and whitish. *Legs*: Leg formula 4=3-2=1, patella-tibia III length equal to IV. Patella-tibia I length 0.8–0.9 ( $\bar{x}$  = 0.84). Legs yellowish-white, lateral surfaces of tibiae I-II greyish, III-IV slightly darkened with darker apical parts, femora I-IV whiter with contrasting dark greyish spots apically on lateral surfaces. Ventral spines of tibia I: outer row, 4; inner row, 4. Metatarsus I with three pairs of long ventral (the basal one reaching middle of tarsus) and two pairs of shorter lateral spines. *Palp*: Closely resembles *E. wanyan*, but bulb slightly longer and narrower, coil of embolus

broader, embolus longer, cymbium longer, with similar waving hairs, apophysis longer and slightly less bent apically (Figs. 59, 60).

**Female:** ( $n = 2$ ). Total length 3.0, 3.1; length of carapace 1.5, 1.6; maximum carapace width 0.9, 1.1, eye field length 0.8, 0.9; eye row I width 1.1, 1.2. Carapace differs from *Euophrys wanyan* by lighter eye field, greyish-yellow between black lateral rims, narrowing light area on anterior thorax extends to rear thoracic margin, limited in the middle of slope by a pair of narrow diagonal brown streaks, extending anteriorly along middle of sides to level of eyes II. Thin dark line along the ventral edge. Face light yellow, whitish under ALE, contrasting with dark eye field; eyes I surrounded with indistinct whitish setae, clypeus more or less bald. Cheliceral teeth as in male. Chelicerae yellow, pedipalps yellow. Ventral aspect generally light yellow and whitish. Abdomen as in *Euophrys wanyan* with grey and whitish pattern consisting of crooked and straight lines, sides with mosaic of lighter and darker spots. **Legs:** Leg formula 4-3-1-2; patella-tibia I length 1.0, 1.1; patella-tibia III length equal to IV. Ventral spines of tibia I: outer row, 5; inner row, 4. Metatarsus I spines as in male. **Epigynum:** With transverse oval white membranous window, spermathecae relatively larger, sclerotized copulatory duct short, membranous duct inconspicuous and short, directed back (Figs. 61, 62).

**Material examined.**—CAROLINE ISLANDS: *Palau*, Koror, taro patch litter, 1♂ (holotype) 1♀, 2 April 1973 (JAB & JWB). Koror, taro patch litter, 1♀ 2imm., 26 March 1973 (JAB & JWB). Koror, #2 taro patch litter, 1♂, 3 April 1973 (JAB & JWB). Koror, banana trash below lab, 1♂, 20 February 1973 (JAB & JWB). Koror, taro patch litter, 1♂ 1♀ 1imm., 30 March 1973 (JWB & JAB).

**Distribution.**—Known only from Koror Island, Palau, in the Caroline Islands.

*Euophrys bryophila* new species  
Figs. 63–69, Map 4

**Holotype.**—Male from Fiji, Viti Levu: Mt. Tomanivi, 1320 m, summit moss forest, moss litter, 20 August 1978 (S. & J. Peck) (AMNH).

**Etymology.**—The name, *bryophila*, is based on the habitat in which the specimens were collected.

**Diagnosis.**—Embolus makes a full, broad circle, epigynum with sclerotized ducts unusu-

ally long, running straight anteriorly, before passing into membranous coil. Placement in this genus is uncertain.

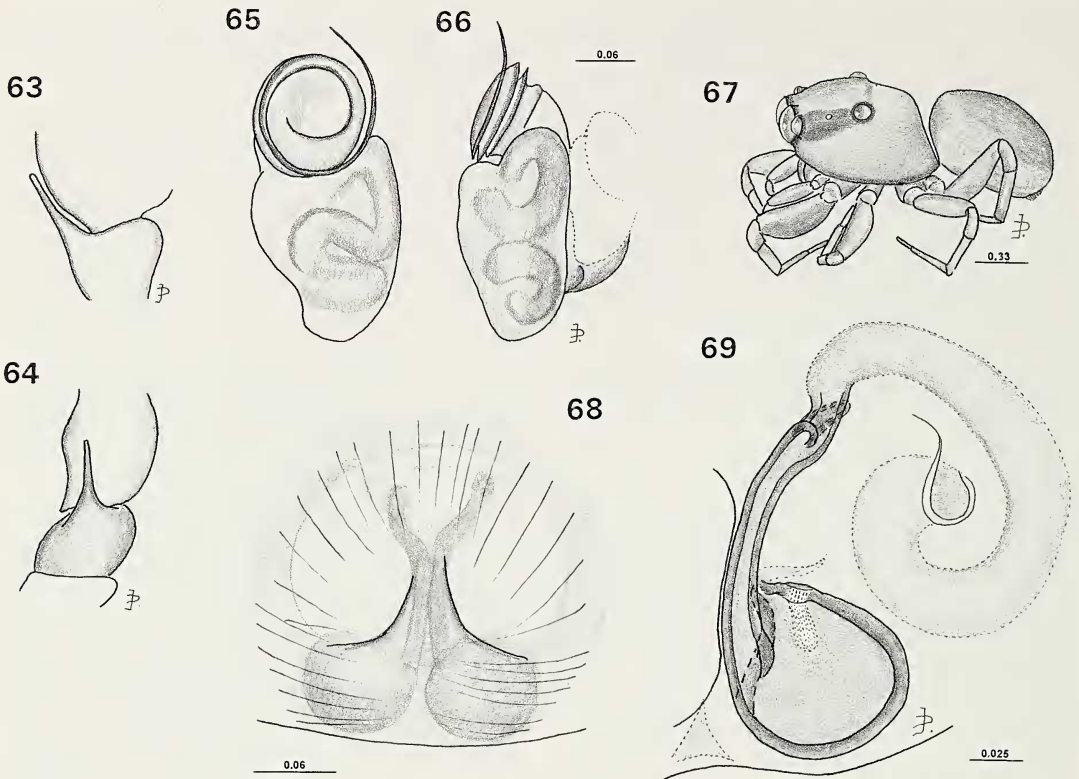
**Description.**—Both sexes, stocky, tegument strongly sclerotized, brown, without contrasting pattern. Carapace broadest at eyes I.

**Male:** ( $n = 3$ ). Total length 1.75–1.85 ( $\bar{x} = 1.80$ ), length of carapace 1.00–1.05 ( $\bar{x} = 1.03$ ); maximum carapace width 0.80–0.85 ( $\bar{x} = 0.82$ ), eye field length 0.60–0.65 ( $\bar{x} = 0.62$ ), eye row I width 0.80–0.90 ( $\bar{x} = 0.85$ ). Carapace almost uniformly brown, bare, shiny. Abdomen dark brownish-grey, with a few lighter spotted diagonal lines, sometimes a thin unpigmented median line. In some specimens the dorsal tegument forms a scutum; in others may be more strongly sclerotized, but does not form a distinct scutum. Face, chelicerae, and pedipalps greyish-brown, only cymbium and tips of chelicerae yellow; setae around eyes I inconspicuous; clypeus bare. Ventral aspect generally brown, abdomen greyish-brown. Chelicerae light with a single cusp tooth on retrolateral edge (unidentate). **Legs:** Leg formula 4-3=1-2, patella-tibia I length 0.55–0.65 ( $\bar{x} = 0.60$ ), patella-tibia III length shorter than IV. **Legs I** greyish-brown. Tibia I with three pairs of ventral spines only, metatarsus with two pairs of long ventral spines and one pair of short lateral spines apically; all spines more or less upright, some perpendicular. **Palp:** membranous base of bulb partially inflated, pushing bulb and embolus out of cymbium, comparison of palp with that of other species difficult; tibial apophysis straight and thin (Figs. 63–66).

**Female:** ( $n = 3$ ). Total length 2.0–2.3 ( $\bar{x} = 2.17$ ), length of carapace 1.1–1.2 ( $\bar{x} = 1.13$ ); maximum carapace width 0.90–0.95 ( $\bar{x} = 0.92$ ), eye field length 0.7–0.8 ( $\bar{x} = 0.73$ ), eye row I width 0.9–1.0 ( $\bar{x} = 0.92$ ). **Legs:** Leg formula 4-3=1-2; patella-tibia I length 0.6–0.8 ( $\bar{x} = 0.68$ ), patella-tibia III length shorter than IV. Coloration and spination as in male. **Epigynum:** With almost round white membranous window, spermathecae small, sclerotized copulatory duct long and almost straight, extended by a broad membranous coiled duct (Figs. 68, 69).

**Material examined.**—Only the type collection: holotype male, plus 3♂5♀, all from Fiji, Viti Levu: Mt. Tomanivi, 1320 m, summit moss forest, moss litter, 20 August 1978 (S. & J. Peck) (AMNH).





Figures 63–69.—*Euophrys bryophila* new species, from Fiji: Viti Levu. 63, Tibial apophysis dorsally; 64, Tibial apophysis laterally; 65, Bulb and embolus of the expanded palpal organ, ventrally; 66, Bulb and embolus of the expanded palpal organ, laterally; 67, General appearance of male; 68, Epigynum; 69, Internal structure of epigynum --single spermatheca and ducts.

**Distribution.**—Known only from Viti Levu, Fiji.

Genus *Evarcha* Simon 1902

**Discussion.**—This large genus contains some 35 species in the Old World, including nine in the Oriental Region, of which only *Evarcha hyllinella* Strand 1913 (from Polynesia and Lombok) is a geographic neighbor; but according to the drawing of its epigynum in Strand 1915, it does not seem to be related. On the other hand, *Mollica pusilla* Strand 1913 from Tahiti, shown in Strand 1915 is apparently an *Evarcha*, although a different species. Many of the Oriental species have externally similar epigyna and can be distinguished only by the internal structure of epigynum.

**Diagnosis.**—Medium-sized unidentate salticids, usually placed close to the genera *Habronattus* F.O.P.-Cambridge 1901 and *Pellenes* Simon 1876, which they resemble in external appearance. They differ by lacking

the palpal conductor present in *Habronattus* and having a basal prolongation of the bulb, not present in other genera. The epigynum lacks the central hood found in *Habronattus* and has the openings larger and further apart than *Pellenes*.

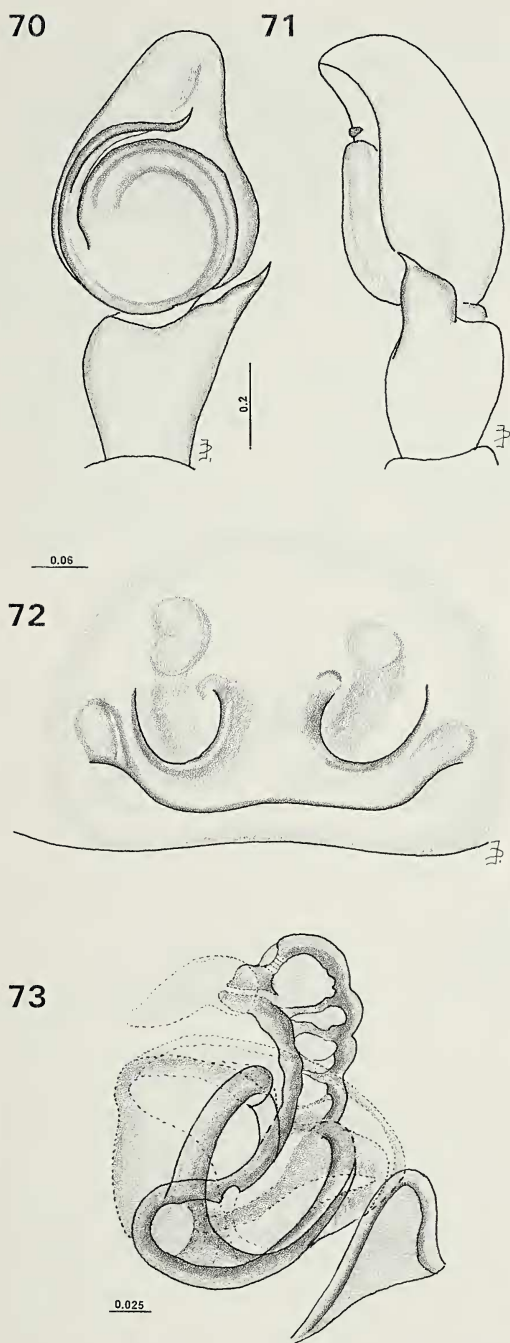
*Evarcha reiskindi* new species

Figs. 70–73

**Holotype.**—Female from Palau Islands, Malakal, grass sweeping, elev. 100 ft., 14 March 1973 (JWB & JAB) (BPBM).

**Etymology.**—This species is named for Dr. Jon Reiskind, an arachnologist at the University of Florida, Gainesville.

**Diagnosis.**—Palpal bulb round, embolus arising probasally, encircling  $\frac{1}{4}$  of bulb, tibial apophysis in lateral view broad with top cut diagonally, ventrally thin, pointed; epigynum short and broad, unusual by chambers of spermatheca extending straight anteriorly, membranous duct broad, making a single coil.



Figures 70–73.—*Evarcha reiskindi* new species, from Palau in the Caroline Islands. 70, Palpal organ ventrally; 71, Palpal organ laterally; 72, Epigynum; 73, Internal structure of epigynum showing right spermatheca and ducts.

Differs from other *Evarcha* by its relatively simple spermatheca and ducts. The only Australian species, *Evarcha infrastrata* (Keyserling 1881), has a similar epigynum with relatively simple internal structure; but the drawing of it (Žabka 1993) is too diagrammatic to draw conclusions; the male palp of that species differs from the species described below by its much longer embolus, making a full circle around bulb. Both male and female of *E. infrastrata* have a striking, tight cluster of stout, curved bristles, below and between lateral eyes II-III, resembling horns.

**Description.**—*Male*: ( $n = 5$ ). Total length 6.0–7.0 ( $\bar{x} = 6.59$ ), length of carapace 2.9–3.6 ( $\bar{x} = 3.32$ ); maximum carapace width 2.1–2.5 ( $\bar{x} = 2.33$ ), eye field length 1.5–1.7 ( $\bar{x} = 1.57$ ), eye row I width 1.8–2.0 ( $\bar{x} = 1.96$ ). Carapace chestnut-brown, including eye field, lateral eyes surrounded by black, with a lighter brown area behind eye field. Fovea small but distinct, and indistinct darker diagonal lines radiate from fovea. Slopes of thorax and sides with indistinct, short, sparse dark setae, lower sides with sparse whitish setae. Face light chestnut-brown, eye I rims black surrounded with inconspicuous whitish setae, clypeus low with sparse, very long upright whitish setae on darker bases, not making any contrasting spot. Chelicerae brown; one retro-lateral cheliceral tooth, one (2-cusped) pro-lateral cheliceral tooth. Light with indistinct rows of linear brown spots on white background and a thin dark median line along anterior half of abdomen; anterior slope and sides whitish. Sparse longer dark setae and short fine bristles give abdomen somewhat hairy appearance. Ventral aspect generally light brown to brownish-yellow, with a darker brown median area ventrally on abdomen. One male specimen entirely pale yellow, with remnants of darker diagonal abdominal pattern. *Legs*: Leg formula 1-4-3-2, with patella-tibia III longer than IV. Patella-tibia I length 2.6–3.5 ( $\bar{x} = 3.14$ ). Legs chestnut-brown, I prolaterally blackish-brown with ventral surfaces of metatarsus, tibia and patella on legs I-II sparsely covered with longer grey setae, and a ridge of similar setae along ventro-pro-lateral edge of femora I-II; no such character in female. Ventral spines of tibia I, outer row = 3, inner row = 3. *Palp*: broad with a circular bulb and long embolus; relatively simple (Figs. 70, 71). Pedipalps yellow.



*Female:* ( $n = 5$ ). Total length 5.7–8.5 ( $\bar{x} = 7.06$ ), length of carapace 3.1–3.5 ( $\bar{x} = 3.22$ ), maximum carapace width 2.2–2.5 ( $\bar{x} = 2.29$ ), eye field length 1.5–1.6 ( $\bar{x} = 1.55$ ), eye row I width 1.8–2.0 ( $\bar{x} = 1.97$ ). Cheliceral teeth and coloration as in male except carapace yellow, including eye field; diagonal broad streaks on abdomen more distinct and two broad dark lines on posterior half of abdomen, enclosing median oval white area. Face yellow; chelicerae yellow, basally bulging. Ventral aspect generally pale yellow, with a darker spot or area medially on abdomen, indistinct lines of darker spots on holotype. *Legs:* Leg formula 3-4-1-2, patella-tibia III longer than IV. Patella-tibia I length 2.1–2.4 ( $\bar{x} = 2.30$ ). Legs yellow, I slightly darker yellow, without darker spots or rings; no ventral fur on legs I-II. Ventral spines of tibia I as in male. *Epigynum:* With broad medium septum, sclerotized posterior rim and simple ducts and spermathecae (see Figs. 73, 74).

**Material examined.**—CAROLINE ISLANDS: Palau, Malakal, grass sweeping, elev. 100 ft., 1 ♀ (holotype), 14 March 1973 (JWB & JAB). Babelthuap, lowland tropical forest north of airstrip (Airai), 1 ♂, 28 March 1973 (JWB & JAB). Babelthuap, roadside above Forestry Hqs. at Nekkin, 1 ♂ 1 ♀, 4 February 1973 (JWB & ERB). Babelthuap, grass field at Forestry Hqs. at Nekkin, 2 ♂ 1 imm., 3 February 1973 (JWB & ERB). Babelthuap, Airai, Forestry Stat., medium grass, sweeping, 1 ♂ 2 imm., 4 February 1973 (JWB & ERB). On rock island east of Malakal, betel palm trash, 1 imm., 8 March 1973 (JWB). Babelthuap, Ngaremlengui, grass field sweeping, 1 ♀, 21 April 1973 (JWB, ERB & JAB). Babelthuap, Ngaremlengui, in woods, 1 ♀ 2 imm., 21 April 1973 (JWB, ERB & JAB). Babelthuap, Airai, mango tree in field, 1 ♀, 7 May 1973 (JWB, ERB & JAB).

**Distribution.**—Known only from Palau in the Caroline Islands.

#### Genus *Holoplatys* Simon 1885

**Discussion.**—This genus was recently revised by Žabka (1991), who recognized six species groups restricted to Australia, adjacent areas and New Zealand.

**Diagnosis.**—Very flat, rather narrow and elongate salticids, 2–11 mm in length, cheliceral retromargin unidentate or without teeth. Cephalic region occupying less than half the length of the carapace, with two shallow depressions between posterior eyes. First pair of legs robust. Tibiae of legs I and II usually

without spines. Color pattern variable, from essentially unicolorous to patterns of chevrons, longitudinal stripes or transverse bands. Patterns more highly developed on abdomen than carapace, which is often unicolorous or with eye region darker. Resembles *Ocrisiona* Simon 1901 in general appearance and genitalia of both sexes. Differs from *Ocrisiona* by having cephalic depressions between the PLE and usually lacking tibial spines on legs I and II (Žabka 1991). There is some resemblance to *Pseudicius* Simon 1885 in body shape, especially flattening of carapace and proportions of length of legs, in shape of tibia I, and reduction of tibial spines. The main difference is the absence of a row of stridulatory spines on tubercles under the lateral eyes and the details of genital organs and the abdominal pattern.

#### *Holoplatys carolinensis* new species

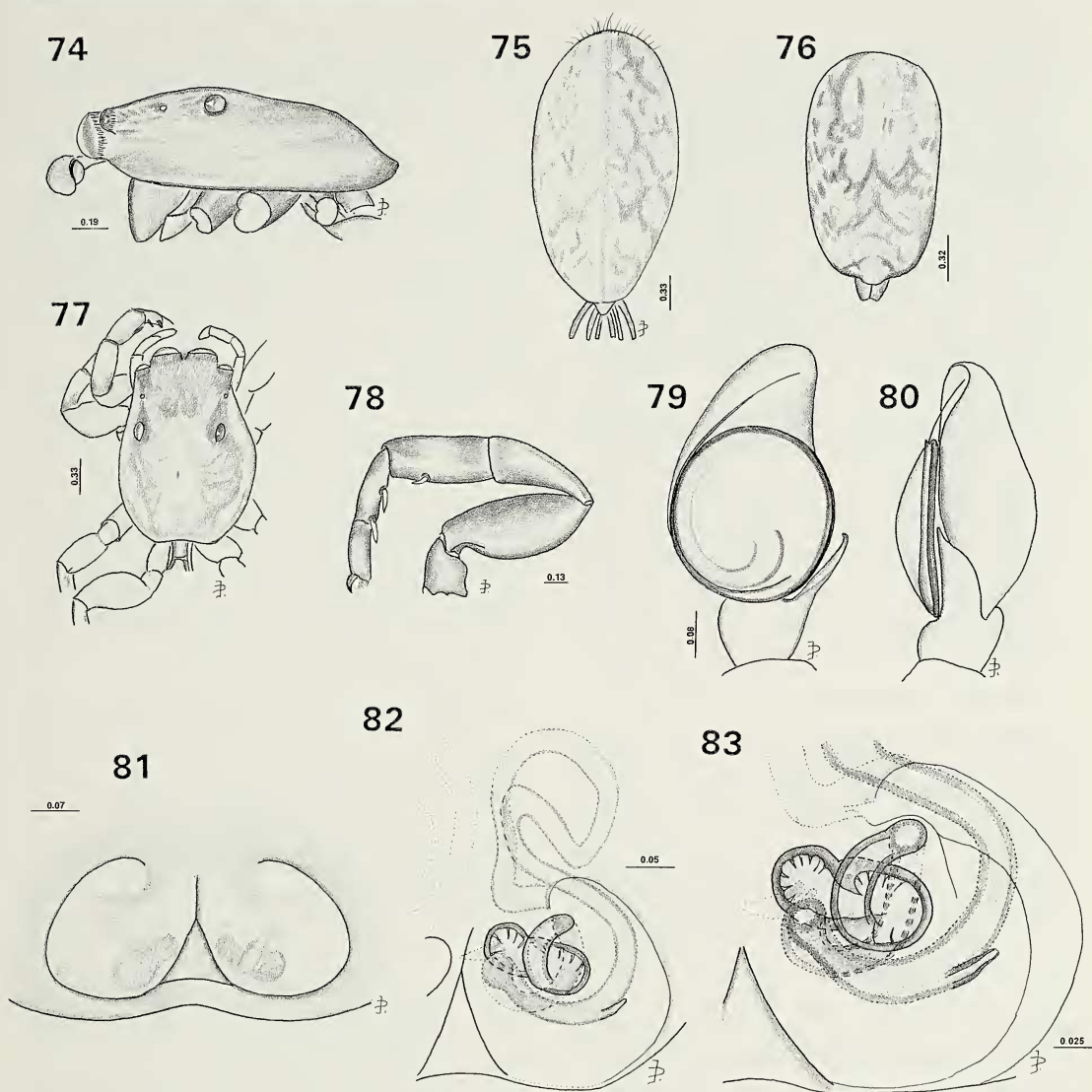
Figs. 74–83

**Holotype.**—Male from Caroline Islands, Yap, Yap Island. Fanif, on coconut trunk, 11 April 1980 (Virginia Tinnig) (BPBM).

**Etymology.**—This species is named for the Caroline Islands, the only area where the species has been found.

**Diagnosis.**—Resembles the *H. grassalis* group (Žabka 1991) in small size, in having a tibial apophysis on the male palp and a long thin embolus. Differs from all other *Holoplatys* species, in the male, by having an almost perfectly circular tegulum and a very long thin embolus which makes about 1½ circles around the tegulum; in the female, by the relatively short broad epigynum and distinctive S-shaped course of the ducts laterally. Placement of the species in *Holoplatys* is tentative.

**Description.**—*Male:* ( $n = 2$ ). Total length 4.2, 3.4, length of carapace 1.7, 1.7; maximum carapace width 1.1, 1.1; eye field length 0.8, 0.8; eye row I width 0.8, 0.9. Carapace low (35–36% of length), moderately broad and long, with eye field shorter than half of carapace, eyes III broader than eyes I, relatively flat surface of thorax about as long as eye field. The posterior slope of the thorax is inclined at about 45°. Colored from light-to-dark brown, with lighter spots, which make a distinct pattern, unlike the other species. Covered with setae, rather indistinct, except on sides where they are grouped into horizontal whitish streaks, separated by darker bare lines.



Figures 74–83.—*Holoplatys carolinensis* new species. 74, Cephalothorax of male, lateral view, from Yap; 75, Abdominal pattern of female; 76, Abdominal pattern of male; 77, Cephalothorax of female, dorsal view; 78, Prolateral view of leg I of male; 79, Palpal organ ventrally, Yap; 80, Palpal organ laterally, Palau; 81, Epigynum, from Palau; 82, Internal structure of epigynum from Yap, single spermatheca and ducts; 83, Details of spermatheca and ducts of epigynum from Palau.

Alignment of eyes I approaches straight line along dorsal most part of their rim, ALE sometimes located somewhat more dorsally, diameter of ALE equal to 0.5 diameter of AME. Eye field darker than thorax, covered with more delicate and colorless adpressed setae, usually arranged angularly along the median longitudinal area; setae on the anterior part may make a whitish spot behind touching point of AME. Clypeus almost absent. One retrolateral cheliceral tooth, two prolateral

cheliceral teeth. Abdomen elongate oval, whitish grey with white internal spots visible through semi-transparent tegument; traces of darker pigmented spots with darker inconspicuous setae, in some specimens reduced to faint rudiments. *Legs*: Leg formula 1-4-2-3; patella-tibia I length 1.2, 1.2; patella-tibia III shorter than IV. Tibia I short, somewhat swollen medially. Legs spineless except for a single proventral spine each on tibiae I and IV and the pairs of ventral spines on metatarsus



I. *Palp*: Slender with slightly broader basal half of cymbium.

*Female*: ( $n = 2$ ). Total length 4.4, 4.9; length of carapace 1.8, 1.9; maximum carapace width 1.3, 1.3; eye field I length 0.8, 0.9; eye row I width 0.9, 1.0. *Legs*: Leg formula 4-1-3-2, patella-tibia I length 1.0, 1.0; patella-tibia III shorter than IV. Females similar to males in coloration, cheliceral teeth, spination and shape. *Epigynum*: triangular median area flanked by two semicircular ridges (Figs. 81-83).

**Material examined.**—CAROLINE ISLANDS: *Palau*, Koror, mangrove swamp, 1♀ 1imm., 20 March 1973 (JWB & JAB). *Palau*, Angaur, under *Casuarina* bark, 1♂, 29 April 1973 (JWB & JAB). *Yap*, Gitam, shrub shaking, 1♀ 1imm., 8 April 1980 (JAB & JWB). Dalipebinau, Fanif, on coconut trunk, 1♂ (holotype), 11 April 1980 (V. Tinnigig).

**Distribution.**—Known only from Palau and Yap in the Caroline Islands.

Genus *Myrmarachne* MacLeay 1839

**Discussion.**—Large genus of ant-like jumping spiders, perhaps the most widely known taxon with that type of adaptation, containing 185 species worldwide, of which as many as 108 occur in the Oriental region. Characterized by constant type of palpal organ and rather uniform type of epigynum, as illustrated in the drawings in this paper. A group of African and Asian species is often considered as genus *Belippo* Simon 1910, and the problem of separating these genera or keeping them together requires further study. Identification as the genus *Myrmarachne* begins usually by mentioning their numerous retrolateral cheliceral teeth, a character rather redundant in view of the obvious appearance. *Belippo* has a movable tibial apophysis on the male palp and secondary seminal receptacles in the epigynum (Wanless 1978a). In *Myrmarachne* the palpal tibial apophysis is immovable and the epigynum lacks secondary receptacles. Identification of species of *Myrmarachne* is difficult because of particularly uniform characters, and requires checking of all possible characters: study of stained preparation of epigyna is especially important because of complicated membranous copulatory ducts, which usually have been overlooked in studies to date. There are no publications covering all Oriental or Pacific species of this genus, and an older paper on *Myrmarachne* of the Philippines by

Banks (1930) gives no details of genital organs. The fundamental revision by Wanless (1978a) is limited to Africa, but descriptions of several species were given by Žabka (1985).

**Diagnosis.**—The only ant-like pluridentate genus in the Pacific, distinguished also by the high cephalic region, constriction between cephalic and much lower thoracic region, slender first legs in both sexes, and greatly elongated male chelicerae.

**Descriptive notes.**—Ant-like, color dorsally usually nearly uniform reddish-brown, sometimes lightening to yellowish. A pair of oblique lateral hair bands on abdomen  $\frac{1}{3}$ – $\frac{1}{2}$  back. Carapace unicolorous except for black rings and bands around eyes. Legs yellowish-white with variable brown markings. Frequently a brown prolateral stripe on femur, patella and tibia. Occasionally some leg segments are entirely brown, usually femur, metatarsus or trochanter.

Carapace constricted and depressed behind eyes to varying degrees. Abdomen of males with dorsal abdominal scutum, entire or divided into anterior and posterior portions at abdominal constriction. Anterior portion of abdomen often swollen and bulging, higher than remainder of abdomen. Females lack scutum and show only a slight constriction of abdomen.

Leg spines are usually present only ventrally on first patella and first and second tibia and metatarsus. Other segments of leg I and legs III-IV lack spines. Patella I with single spine. Tibiae and metatarsi have two longitudinal rows of ventral spines. Metatarsi almost invariably have two spines in each row. Ventral tibial rows vary from 4-6 per row on tibia I and 2-4 per row on tibia II. Females tend to average one more spine per row than males on tibia I-II. Spination patterns vary little from species to species.

Genitalia in both sexes are small and rather similar among the various species. Palpal differences between species are relatively slight. Epigynum shows little detail externally with internal structure more complex, but the significance of the slight variations in coiling of the ducts is unknown at present. However, one of the authors (JP) believes that it is significant. It is likely that the more complex the coiling the more variable it is. The species



Map 5.—Distribution of *Myrmarachne edentata* new species (★) from the Yap Island, *Myrmarachne pisarskii* new species (■) from Palau and *Myrmarachne edwardsi* new species (□), also from Palau.

may be more readily separated by non-genital characters.

*Myrmarachne edentata* new species

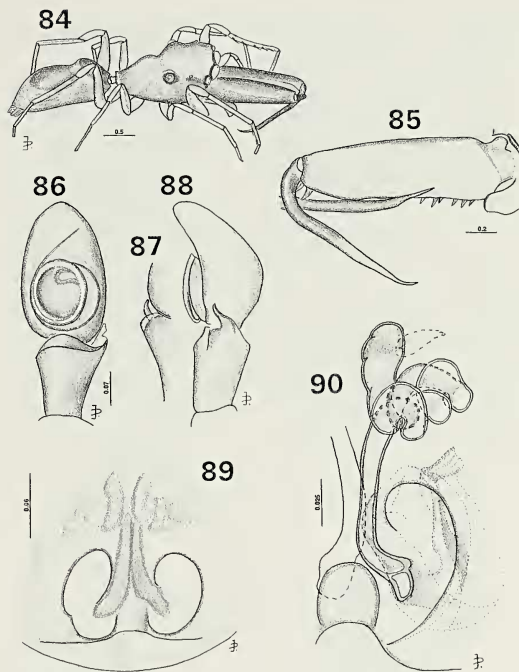
Figs. 84–90, Map 5

**Holotype.**—Male from Yap, Caroline Islands, Fedor village, Dalipebinau, shaken from trees in coconut forest, 29 January 1980 (JWB) (BPBM).

**Etymology.**—The name *edentata*, toothless, refers to the absence of a basal tooth on the inner margin of the fang in males.

**Diagnosis.**—The keeled chelicerae of the male with only the dorsal medial margin angular and the absence of a tooth on the inner margin of the fang near its base distinguish *edentata* from the other species included here. The granular eye region separates it from the other included species of which females are known. Epigynal duct forming three loops next to seminal receptacles.

**Description.**—*Male:* ( $n = 5$ ). Total length without chelicerae 3.1–4.2 ( $\bar{x} = 3.64$ ), length of chelicerae 1.3–2.2 ( $\bar{x} = 1.70$ ), length of carapace 1.5–2.0 ( $\bar{x} = 1.74$ ), maximum carapace width 1.0–1.1 ( $\bar{x} = 1.02$ ), eye field length 0.8–0.9 ( $\bar{x} = 0.85$ ), eye row I width 0.9–1.1 ( $\bar{x} = 0.96$ ). Chelicerae with a row of 10–12 promarginal teeth, large distally and reducing to denticles proximally, and 5–6 smaller retromarginals, the two rows close together and almost merging proximally. Chelicerae some-



Figures 84–90.—*Myrmarachne edentata* new species, from Yap. 84, General appearance of male; 85, Chelicera, lateral view, showing both fangs; 86, Palpal organ ventrally; 87, Tibial apophysis dorsally (shape of transparent plate uncertain); 88, Palpal organ laterally; 89, Epigynum; 90, Internal structure of epigynum, showing duct with three loops next to seminal receptacle.

what longer than carapace, keeled on inner dorsal margin, sloping downward laterally, not obviously flat on top as many other species are, somewhat compressed, retrolateral teeth set on a slight ventral keel, fang slender, round in cross-section, lacking inner teeth near base, nearly straight except at base and tip. Extension of lateral surface in the form of a flap medially to fang basis, with a prominent tooth protruding anteriorly beneath the flap. Eye region of carapace and posterior lateral portions finely granular, central posterior region finely rugulose, a pair of long dorsal setae in constriction. Abdomen with complete dorsal scutum which appears divided by a constriction about  $\frac{1}{3}$  of the way back, with oblique lateral bands of white setae. *Legs:* Leg formula 4-1-2-3; patella-tibia I length 1.2–1.7 ( $\bar{x} = 1.41$ ), patella-tibia III longer than IV. Tibia I with 4–5 pairs of ventral spines, tibia II with 0–3 pairs, most frequently 2. *Palp:*



Tegulum smaller than in other species described here, otherwise not distinctive.

**Female:** ( $n = 5$ ). Total length 3.5–4.6 ( $\bar{x} = 4.02$ ), length of carapace 1.7–2.0 ( $\bar{x} = 1.80$ ), maximum carapace width 0.9–1.1 ( $\bar{x} = 1.01$ ), eye field length 0.8–0.9 ( $\bar{x} = 0.84$ ), eye row I width 0.9–1.0 ( $\bar{x} = 0.96$ ). Chelicerae  $\frac{1}{4}$  length of carapace or less, vertical; 6–7 teeth on each cheliceral margin. Carapace microculture as in male. Overall coloration lighter brown than in male, otherwise same. Tibia I with 4–6 pairs of ventral spines (usually 5), tibia II with 1–4 pairs (usually 3). Abdomen with a lateral pair of round white spots at the level of constriction. **Legs:** Leg formula 4-1-3-2; patella-tibia I length 1.2–1.4 ( $\bar{x} = 1.26$ ), patella-tibia III shorter than IV. **Epigynum:** As in diagnosis (Fig. 90).

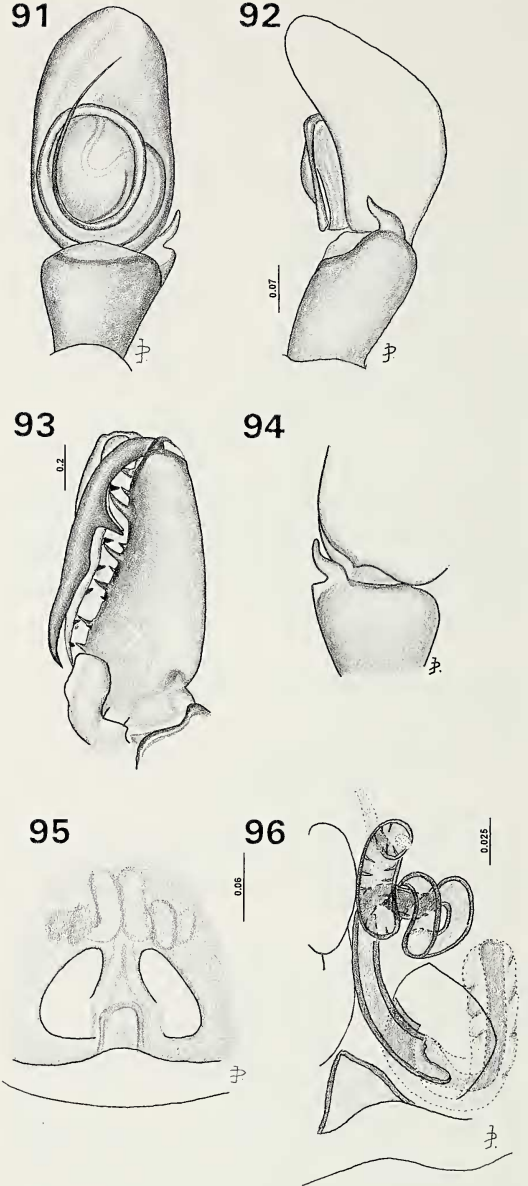
**Material examined.**—**CAROLINE ISLANDS:** Yap, Map, sweeping/shaking, 1♂2♀4imm., 30 May 1973 (JAB & JWB). Fanif, tree shaking, 2♀1imm., 11 April 1980 (JAB & JWB). Fanif, shaking dead banana leaves, 2♀1imm., 16 April 1980 (JAB & JWB). Fanif, tree shaking, 1♀1imm., 16 April 1980 (JAB & JWB). St. Mary's school, Colonia, sweeping bushes, 1♂1imm., 11 March 1980 (JWB). Colonia, burned hilltop litter, 1♂, 28 May 1973 (JWB, ERB & JAB). Colonia, tower hill, 1♀1imm., 28 May 1973 (JWB, ERB & JAB). Map, Chool, tree shaking, 1♂, 12 April 1980 (JAB & JWB). Gitam, shrub shaking, 2♀, 8 April 1980 (JAB & JWB). Fedor village, tree shaking, 1♀, 4 March 1980 (JWB). Fedor village, Dalipebinau municipality, tree shaking-coconut forest, 2♂(including holotype)2imm., 29 January 1980 (JWB). Gilman, sweeping low vegetation, 2♂, 15 April 1980 (JAB & JWB). Gilman Point, shaking bananas, 2♀, 29 May 1973 (JWB, ERB & JAB). Gagil-Tomil, shaking bananas, 2♀, 29 May 1973 (JWB, ERB & JAB). Aringel village, tree shaking, mature forest, 2♂3imm., 1 February 1980 (JWB). Ruul District, 2♂, 20 August 1950 (R.J. Goss) (BPBM). Central Yap, 1♂, 31 July 1950 (R.J. Goss) (BPBM). Yap, Caroline Is., 1♂, August 1952 (N.L.H. Krauss) (BPBM). **MARIANAS ISLANDS:** Guam, Mt. Lamlam, 1♀, (no date or collector) (BPBM).

**Distribution.**—Known only from Yap in the Caroline Islands and Guam in the Marianas Islands.

*Myrmarachne pisarskii* new species

Figs. 91–96, Map 5

**Holotype.**—Male from Caroline Islands, Palau, Babelthuap Island, Airai, shaken from tree in field, 7 May 1973 (JAB, JWB & ERB)(BPBM).



Figures 91–96.—*Myrmarachne pisarskii* new species, from Palau. 91, Palpal organ ventrally; 92, Palpal organ laterally; 93, Chelicera, lateral view; 94, Tibial apophysis dorsally; 95, Epigynum; 96, Internal structure of epigynum showing single spermatheca and duct with two loops adjacent to seminal receptacle.

**Etymology.**—Named for the late Dr. Bohdan Pisarski, life-long student of ants, Professor in the Institute of Zoology, Polish Academy of Sciences and its long-time Director; a friend of one of the authors (JP) and the co-

participant in their collecting trip to Indonesia, Vietnam and North Korea in 1959.

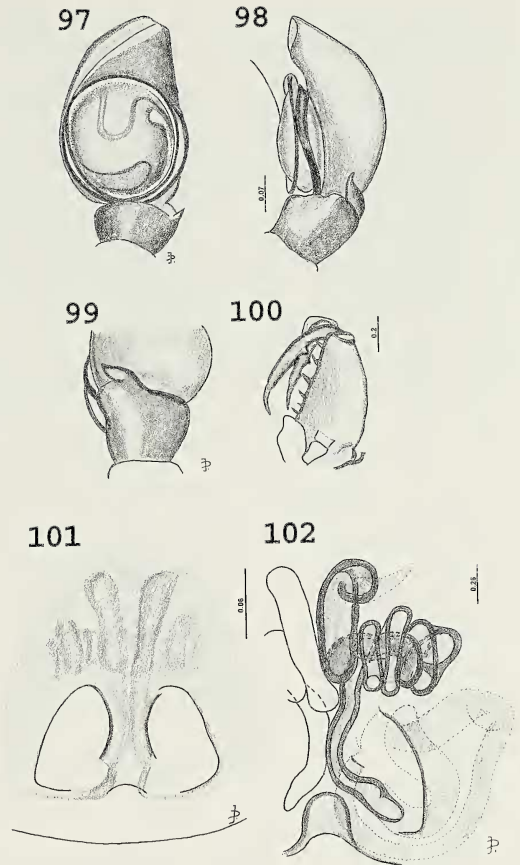
**Diagnosis.**—Male with a large tooth on internal margin of fang near base. Distal loop of embolus consistently narrower than proximal loop. Female epigynal duct forming only two loops adjacent to seminal receptacle.

**Description.**—*Male:* ( $n = 5$ ). Total length without chelicerae 3.3–4.3 ( $\bar{x} = 3.79$ ), length of chelicerae 0.9–1.6 ( $\bar{x} = 1.22$ ), length of carapace 1.6–2.0 ( $\bar{x} = 1.83$ ), maximum carapace width 0.8–1.2 ( $\bar{x} = 1.06$ ), eye field length 0.8–1.0 ( $\bar{x} = 0.88$ ), eye row I width 0.9–1.1 ( $\bar{x} = 0.99$ ). Upper surface of carapace very finely granular, but also shiny, i.e., less conspicuously granular than *Myrmarachne edentata* new species. Chelicerae flattened dorsally with angular edges, almost uniform in width except dorsally; fang with large inner tooth about  $\frac{1}{2}$  length and two smaller ones just past midlength. Cheliceral teeth in two rows. Well developed post-ocular and abdominal constrictions. *Legs:* Relative leg length is 4-1-2-3; patella-tibia I length 1.2–1.9 ( $\bar{x} = 1.50$ ), patella-tibia III length shorter than IV. Spination as in *M. edentata*.

*Female:* ( $n = 3$ ). Total length 4.4–5.5 ( $\bar{x} = 4.76$ ), length of carapace 1.9–2.4 ( $\bar{x} = 2.10$ ), maximum carapace width 1.1–1.4 ( $\bar{x} = 1.20$ ), eye field length 0.9–1.1 ( $\bar{x} = 0.96$ ), eye row I width 1.0–1.2 ( $\bar{x} = 1.06$ ). Upper surface of carapace shiny, not granular, strong post-ocular constriction. Abdomen without constriction or swelling. *Legs:* Leg formula 4-1-3-2; patella-tibia I length 1.4–1.9 ( $\bar{x} = 1.56$ ), patella-tibia III shorter than IV. Spination as in *M. edentata*. See descriptive notes for genus. *Epigynum:* Not externally distinguishable from other species (Figs. 95, 96).

**Material examined.**—CAROLINE ISLANDS: *Palau*, Babelthuap, roadside above Airai Forest Hqs., sweeping, hand collecting, 1♂3imm., 4 February 1973 (JWB & ERB). Babelthuap, Airai, tree in field, 2♂(including holotype)1♀1imm., 7 May 1973 (JAB & JWB). Babelthuap, Nekkin, mixed forest, shaking trees below forestry hqs., 1♂, 3 February 1973 (JWB & ERB). Babelthuap, Airai, tree in field, 1♂1♀, 5 May 1973. Babelthuap, Ngar-emlengui, in woods, 1♂3imm., 21 April 1973 (JWB, ERB & JAB).

**Distribution.**—Known only from Palau in the Caroline Islands.



Figures 97–102.—*Myrmarachne edwardsi* new species, from Palau. 97, Palpal organ ventrally; 98, Palpal organ laterally; 99, Tibial apophysis dorso-laterally; 100, Chelicera of male, lateral view; 101, Epigynum; 102, Internal structure of epigynum, showing four loops of epigynal duct adjacent to seminal receptacle.

*Myrmarachne edwardsi* new species

Figs. 97–102, Map 5

**Holotype.**—Female from Palau, Koror Island, litter adjacent to taro patch, 26 March 1973 (JAB & JWB) (BPBM).

**Etymology.**—Named for Dr. G.B. Edwards of the Florida State Collection of Arthropods; Gainesville, Florida.

**Diagnosis.**—Male with large tooth on internal margin of fang near base (Fig. 100). Distal and proximal loops of the embolus the same size, circular overlapping, usually appearing as a single loop in ventral view (Fig. 97). Female epigynal duct forming four loops adjacent to seminal receptacles.

**Description.**—*Male:* ( $n = 5$ ). Total length



without chelicerae 3.2–4.0 ( $\bar{x}$  = 3.54), length of chelicerae 0.4–1.8 ( $\bar{x}$  = 1.02), length of carapace 1.4–2.1 ( $\bar{x}$  = 1.72), maximum carapace width 0.9–1.2 ( $\bar{x}$  = 1.03), eye field length 0.7–0.9 ( $\bar{x}$  = 0.82), eye row I width 0.8–1.1 ( $\bar{x}$  = 0.94). General appearance as in *Myrmarachne pisarskii*. Chelicerae flattened dorsally with angular margins. Cheliceral teeth: 5–6 small in outer row, 9 large in inner row. Eye region of carapace granular (appears minutely rugulose in one specimen from Sonsorol). *Legs*: Leg formula 4-1-3-2, patella-tibia I length 0.9–1.8 ( $\bar{x}$  = 1.36), patella-tibia III shorter than IV. Ventral spines of tibia I 4–5 pairs. *Palp*: Loops of embolus forming two closely overlapping circles so that only a single loop is easily seen.

The single male from Sonsorol Island differs in sculpture of the carapace, but it is apparently recently molted and appearance might change with age. With only one specimen available, we choose not to regard it as a separate species. Likewise, we exclude it from the paratype series.

*Female*: ( $n$  = 5). Total length 3.2–4.9 ( $\bar{x}$  = 4.15), length of carapace 1.5–2.0 ( $\bar{x}$  = 1.77), maximum carapace width 0.9–1.1 ( $\bar{x}$  = 1.05), eye field length 0.7–1.0 ( $\bar{x}$  = 0.83), eye row I width 0.8–1.1 ( $\bar{x}$  = 0.95). General appearance as in *M. pisarskii*. Chelicerae short, vertical. Eye region shiny, appearing smooth at low magnification, very minutely sculptured at high magnification. *Legs*: Leg formula 4-1-3-2; patella-tibia I length 0.9–1.6 ( $\bar{x}$  = 1.22), patella-tibia III shorter than IV. Ventral spines of tibia I 4–5 pairs. *Epigynum*: Internal duct making four loops adjacent to receptacle (Fig. 102).

**Material examined.**—CAROLINE ISLANDS: Palau, Kayangel, sweeping in field, 1♀, 21 May 1973 (JWB). Koror, shaking banana trees, 1♀, 31 March 1973 (JAB & JWB). Koror, litter adjacent to taro patch, 1♀ (holotype), 26 March 1973 (JAB & JWB). Koror, taro patch litter, 1♂, 2 April 1973 (JAB & JWB). Malakal, grass sweeping, elev. 100 ft., 1♂, 14 March 1973 (JAB & JWB). Pulo Anna, coconut/scrub tree shaking, 2♀3imm., 7 April 1973 (JWB & ERB). Sonsorol Island, grass sweeping, 1♂, 10 April 1973 (JWB & ERB). Peleliu, mixed tropical forest, 2♂, 22 March 1973 (JWB & ERB). Ngurukdabel I., Ngaremediu, 2♂, 14 May 1957 (C.W. Sabrosky) (BPBM). S Auluaptigel, 1♂, 13 December 1952 (J.L. Gressitt) (BPBM).

**Distribution.**—Known only from the Palau group of the Caroline Islands.

Genus *Omoedus* Thorell 1881

**Discussion.**—A genus of three previously described small spiders (*Omoedus kulczynskii* Prószyński 1971; *O. niger* Thorell 1881; and *O. piceus* Simon 1902) known from Indonesia, New Guinea and northern Australia. In the absence of male specimens the species described here is only tentatively placed in this genus.

**Diagnosis.**—Small unidentate salticid. Eye region higher than thoracic, abdomen heart shaped. Ocular quadrangle rectangular, as wide behind as in front, occupying about half the length of cephalothorax or a little less. Carapace heavily sclerotized. Male palp of the euophryine type.

*Omoedus cordatus* new species

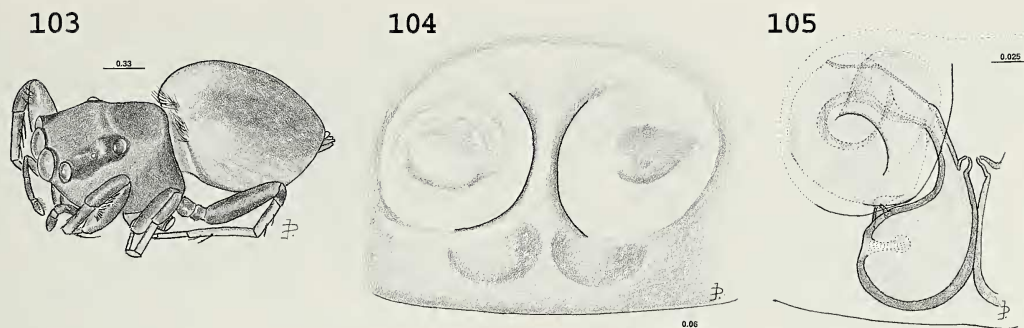
Figs. 103–105

**Holotype.**—Female from Fiji, Vitu Levu, Nandarivatu, hill behind village, in litter, 12 April 1987 (JWB) (BPBM).

**Etymology.**—The name, *cordatus*, is in reference to the distinctly heart-shaped abdomen.

**Diagnosis.**—Long coiled membranous copulatory duct of the spherical spermathecae and two accessory gland openings (Fig. 105) differentiates this species from others of the genus. The male is unknown.

**Description.**—*Female*: Total length 2.6 ( $n$  = 1); maximum carapace length 1.2; maximum carapace width 1.1; length of eye field 0.6; width of first eye row 2.0; length of first tibia-patella 0.8. Carapace with integument strongly sclerotized but without warts or papillae, uniformly dark brown with sparse, indistinct, small setae; there are also minute, shiny scales, also very sparse. Entire dorsal surface of carapace is flat, inclined anteriorly, with posterior edge the highest; however, eye field is slightly higher than thorax. Posterior and lateral walls of carapace are almost vertical, carapace slightly broader behind eye field, the posterior edge of thorax rounded. Abdomen higher and broader than carapace, heart shaped, brown with indistinct rows of lighter spots, with dense brush of short but thick, curved setae along antero-dorsal edge, which is curved to accommodate the rounded thoracic edge. Frontal aspect brown, with



Figures 103-105.—*Omoedus cordatus* new species, from Fiji, Viti Levu. 103, General appearance of female; 104, Epigynum; 105, Internal structure of epigynum, left side.

sparse inconspicuous setae around eyes I, clypeus low, appearing bare with few inconspicuous brown bristles, set diagonally above ventral edge, three curved bristles below AME. Chelicerae short, slender, brown with light tips. One retrolateral cheliceral tooth, two prolateral cheliceral teeth. Pedipalps and femur-tibia I brown with light tips; metatarsus and tarsus I light. *Legs*: A row of stiff black setae along ventral edge of apical half of femur, making a sort of cutting edge with surfaces of patella and tibia. Legs short and slender, femora I-IV brown, patellae II-IV with dorsal surface yellow, tibiae I-III brown with light apical tips, tibia IV yellow, metatarsi and tarsi I-IV yellowish white. Leg formula 4-1-2 (3rd legs missing). Ventral spines of tibia I: outer row, 3; inner row, 3. Spines on tibia I

very long, those on metatarsus I extremely long, almost touching tarsal claw. *Epigynum*: with two large membranous windows, anteriorly not separated and with complicated circular furrows on surface; simple spherical spermatheca with anterior straight, not sclerotized, copulatory duct (Figs. 104, 105).

**Material examined.**—Only the holotype.

**Distribution.**—Known only from Viti Levu in Fiji.

#### Genus *Palpelius* Simon 1903

**Discussion.**—The genus contains nine species described from Borneo to Australia, including Mollucas and Bismarck Archipelago. No species of *Palpelius* has been described yet from Polynesia.

**Diagnosis.**—Unidentate salticids having leg III equal to or exceeding leg IV in length, and ocular quadrangle occupying about half the length of carapace, narrowing posteriorly. The male palp is euophryine with embolus confined to distal portion of the bulb, curving counter-clockwise (left palp). The epigynum has two large membranous windows with the copulatory openings at their posterior edges, relatively short median ducts turn outward to lateral spermathecae.

#### *Palpelius namosi* new species

Figs. 106-110, Map 6

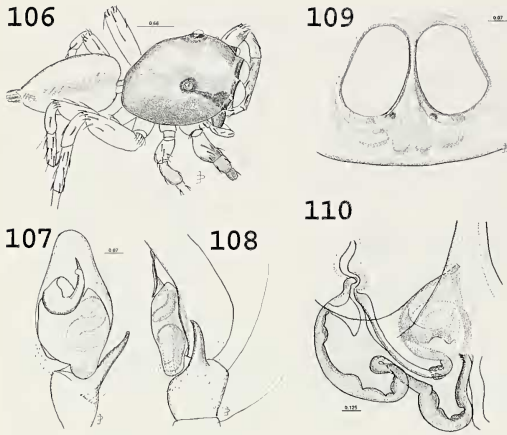
**Holotype**—Female from Fiji, Viti Levu, Namosi District, hill forest on Namosi Road, about 7 km N of Queen's Road, 19 May 1987 (JWB & ERB) (BPBM).

**Etymology.**—Named for a region in Fiji, the Namosi District, one of the locations where this species is found.



Map 6.—Distribution of *Palpelius namosi* new species from Fiji (★), and *Palpelius trigyrus* new species (■) from Yap in the Caroline Islands.





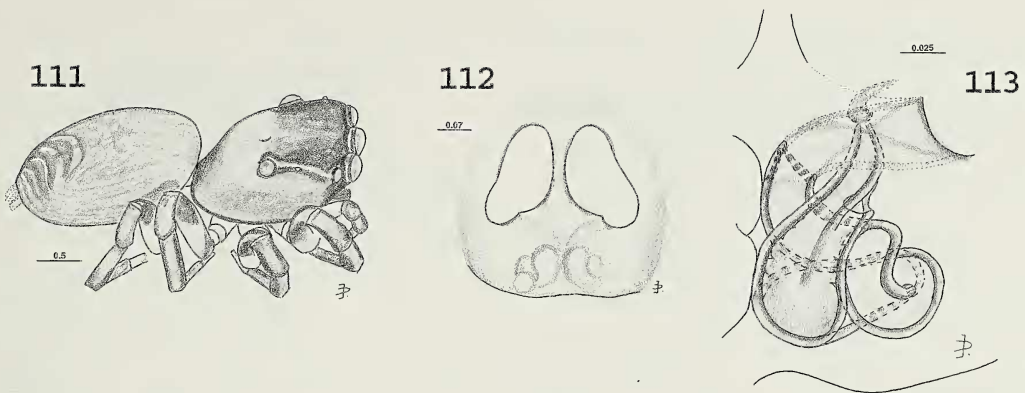
Figures 106–110.—*Palpelius namosi* new species, from Fiji: Viti Levu. 106, General appearance of male; 107, Palpal organ ventrally; 108, Palpal organ laterally [dotted lines denote white/colorless setae]; 109, Epigynum of female from Namosi District, Viti Levu; 110, Internal structure of same epigynum showing single spermatheca and ducts.

**Diagnosis.**—Male with embolus broad, a flat coil on distal part of bulb, tibial apophysis long and pointed. Female with epigynal windows larger, and epigynal ducts less coiled, than in *P. trigyryus* new species.

**Description.**—*Male:* ( $n = 5$ ). Total length 4.0–5.6 ( $\bar{x} = 4.66$ ), length of carapace 2.1–2.6 ( $\bar{x} = 2.30$ ), maximum carapace width 1.4–2.0 ( $\bar{x} = 1.68$ ), eye field length 1.0–1.5 ( $\bar{x} = 1.22$ ), eye row I width 1.5–1.9 ( $\bar{x} = 1.64$ ). Carapace sloping anteriorly, highest at level of eyes III, more gently inclined posteriorly, passing abruptly into steep posterior slope; brown, covered with adpressed, reddish, thin setae, a whitish diamond-shaped area behind eye field, covered with inconspicuous whitish setae, much thinner than the reddish ones. Abdomen elongate, narrowing posteriorly, narrower than carapace; greyish-yellow with marginal areas covered with darker grey spots making an irregular pattern and entering median streak as indistinct wedges. Sides lighter yellow with darker, grey spots, merging with light, ventral surface without spots. Spinnerets cylindrical, yellowish-grey. Frontal aspect yellowish-brown, lighter beneath eyes, eyes surrounded with red setae, clypeus low, almost bare with a few stronger bristles and sparse brown setae along edge; chelicerae narrow and short, apically rectangular with depressed transverse area and a small, flat, triangular

protuberance pointed along cheliceral axis, medio-distally. One retrolateral cheliceral tooth, two prolateral cheliceral teeth. Pedipalps whitish-yellow, with cymbium slightly darker, whitish-fawn. Several dark bristles scattered over dorsal surfaces of pedipalpal patella, tibia and cymbium, a particularly long one at the apical edge of patella and tibia, these segments and cymbium covered with grey and colorless setae. Mouth parts light brown, retrolateral tooth triangular and gently sloping; sternum, coxae and femora ventrally whitish with grey-yellow shade, abdomen whitish-grey with anterior part slightly yellowish-grey. *Legs:* Leg formula 3=4-1-2 or 3=4-2-1; patella-tibia I length 1.4–2.4 ( $\bar{x} = 1.68$ ), patella-tibia III equal to IV. Legs light yellowish-grey with darker, sparse short setae and numerous prominent brown spines. Ventral spines of tibia I: outer row, 3; inner row, 3 (2–3). Indistinct darkening on apical part of tibia I, femora I–IV whitish ventrally. *Palp:* Euophryine type with bulb narrow, elongate, narrowing posteriorly, embolus making flat coil on anterior ventral surface of bulb, tip of embolus appearing double due to internal duct, cymbium narrow. Palpal tibia narrow, slightly shorter than cymbium; tibial apophysis long, slightly curved; there are characteristic long bristles dorsally on tibia and patella and a few shorter ones on cymbium.

*Female:* ( $n = 2$ ). Total length 5.4, 8.4, length of carapace 2.2, 3.4; maximum carapace width 2.0, 2.5; eye field length 1.4, 1.8; eye row I width 1.8, 2.3. Coloration as in male. Eye field chestnut-brown, almost bare but with triangle of white setae between AME; sides yellow crossed by three diagonal dark brown streaks, radiating from fovea towards coxae II–IV; a horizontal faint brown line along eye field, separating lighter yellow line below eyes III; margin of carapace brown. Face dark yellow, eyes I surrounded by reddish setae except ventrally and between AME, where white. Clypeus low, almost bare, with a few inconspicuous white setae and three curved brown bristles. Chelicerae slightly bulging, dark yellow, laterally light brownish. Cheliceral teeth as in male. Pedipalps light brown. *Legs:* Leg formula 3=4-1-2; patella-tibia I length 1.7, 2.4 with patella-tibia III about equal to IV. Legs brown with middle parts of segments slightly lighter, spines as in male. *Epigynum:* With two large anterior oval



Figures 111–113.—*Palpelius trigyrus* new species, from Yap, Caroline Islands. 111, General appearance of female; 112, Epigynum; 113, Internal structure of epigynum showing single spermatheca and ducts.

membranous windows with copulatory openings at posterior edge of windows, broad median ducts leading to a sclerotized posterior chamber, from where a short diagonal duct leads to oval spermathecae, located laterally; entrance duct membranous (according to Davies & Žabka in *P. beccarii*, that part does not differ from spermatheca) and has a somewhat complicated structure not yet fully understood. Apparently a first accessory gland leads from entrance duct towards tegument surface; a second, porous accessory gland located near end of spermatheca.

**Material examined.**—**FIJI:** *Viti Levu*, Namosi District, hill forest on Namosi Road, about 7 km N of Queen's Road, 1♀ (holotype), 19 May 1987 (JWB & ERB). Nandarivatu, in house, elev. 900 m, 1♂, 11 April 1987 (JWB, ERB & JAB). Nandarivatu, tree shaking, elev. 900 m, 1♀, 11 April 1987 (JWB & ERB). Nandarivatu, on abandoned building, elev. 900 m, 1♂, 11 April 1987 (JWB, ERB & JAB). Nandala Creek, 2 mi. S of Nandarivatu, sweeping/shaking. 1♂, 12 April 1987 (JWB & ERB). Nandarivatu, hill behind village, litter, 1♂, 12 May 1987 (JWB). Tholo-I-Suva Forest Park, Waisila Falls Trail, sweeping, 1♂, 11 May 1987 (JWB).

**Distribution.**—Known only from Viti Levu in Fiji.

*Palpelius trigyrus* new species  
Figs. 111–113, Map 6

**Holotype.**—Female from Caroline Islands, Yap, Fanif, on coconut trunks, 11 April 1980 (V. Tinnigig) (BPBM).

**Etymology.**—The name *trigyrus* refers to the three loops of the copulatory duct.

**Discussion.**—Placement of this species with respect to the previous species is uncertain. However, similarity in external appearance of the epigynum, possible relation in internal structure, similar shape of carapace, similarity in proportions of length of eye field, height of carapace, length of flat surface of carapace, and similar spination of tibia I and II, suggest that they may be related. Characters suggesting different status are width of eye fields I and III and length of leg III and fissidentate cheliceral tooth. Further studies, including collecting male specimens, will be required to assign this species properly.

**Diagnosis.**—Membranous windows of epigynum set slightly diagonally, narrower posteriorly than in *Palpelius namosi* new species; copulatory duct long, making three loops (Fig. 113). The male is unknown.

**Description.**—*Female:* ( $n = 1$ ). Total length 4.9; length of carapace 2.3; maximum carapace width 1.6; eye field I length 1.3; eye row I width 1.3. With broad, medium height carapace with expanded flattened area, broad oval abdomen. Carapace dark brown with lighter brown flat anterior part of thorax and an almost black eye field; all with sparse whitish and colorless setae. Abdomen dark grey with yellow spots along bottom of folds, making indistinct pattern (Fig. 111). Anterior eyes surrounded with orange setae and a few white ventrally; aligned straight along dorsal-most points of their rim, the diameter of ALE about 62% of that of AME. Clypeus brown, very low, almost bare, with a row of long white setae overhanging cheliceral bases. Chelicerae



of medium size, chestnut-brown, with transverse grooves. One retrolateral cheliceral tooth (bicusp), two prolateral cheliceral teeth. Pedipalps and mouth parts brown, sternum light brown, coxae yellowish; abdomen anteriorly yellowish, grey behind epigastric furrow with four lines of spots. *Legs*: Patella-tibia I length 1.5; relative length 4-1-3-2, patella-tibia III shorter than IV. Legs short and robust; dark brown, locally lighter, with ventral surface of femora whitish-yellow. Ventral spines of tibia I: outer row, 3; inner row, 3. *Epigynum*: with two white elongate oval windows separated by a thin septum, converging copulatory canals and convoluted spermathecae (Figs. 112, 113).

**Material examined.**—The holotype and an additional female with the same collection data.

**Distribution.**—Known only from Yap in the Caroline Islands.

Genus *Phintella* Bösenberg & Strand 1906

**Discussion.**—*Phintella* is in many ways similar to *Chrysilla* Thorell 1897, both with relatively long abdomen pointed behind, long legs and palp of non-euophryine type. Several species have been transferred from *Chrysilla* to *Phintella* recently (Platnick 1989).

**Diagnosis.**—Cephalothorax broad with almost parallel sides, moderately high, eyes III at the edge of flat surface. Abdomen lower and narrower than cephalothorax, gradually tapering and pointed posteriorly. Cheliceral retromarginal tooth single. Legs long and robust; with tibia I somewhat swollen and narrowing at both ends; three pairs of ventral spines and one prolateral spine, in females these spines are much reduced in length but robust; metatarsus with two pairs of ventral spines. In males leg formula is 1-4-2=3, in females 4-1-2=3.

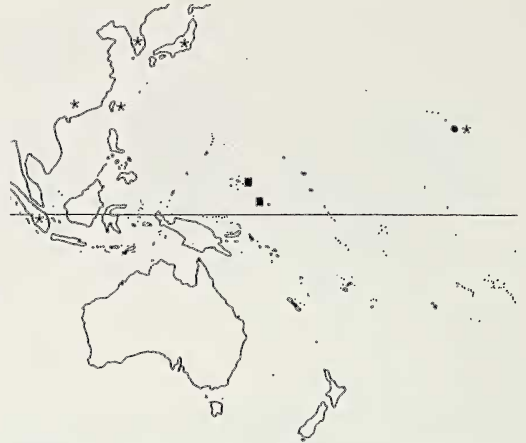
*Phintella versicolor* (C.L. Koch 1846)

Map 7

*Plexippus versicolor* C.L. Koch 1846.

*Phintella versicolor* (C.L. Koch): Prószyński 1983.

**Discussion.**—Although it is not included in the catalog of Hawaiian spiders (Suman 1964) this species is fairly common in Hawaii. Many specimens are in the collections of the Bishop Museum and the American Museum of Natural History. A list of additional synonyms is given by Prószyński (1990).



Map 7.—Distribution of *Phintella versicolor* (★) and *Phintella planiceps* new species (■) from the Caroline Islands.

**Material examined.**—**HAWAIIAN ISLANDS:** *Hawaii County*. Kohala District, rt. 250 at Kapaau road, shaking trees, 2♂9♀ 1imm., 15 February 1995 (JWB & ERB); Lapahoehoe, elev. 500 ft, shaking banana leaves, 1♀, 20 February 1995 (JWB & ERB); Kolekole Park near Hilo, tree shaking, 2♂2♀6imm., 21 February 1995 (JWB & ERB); Stainback Hwy., elev. 1000 ft., shaking bushes by road, 1♂, 23 February 1995 (JWB & ERB); Opihioa Road near Pahoa, shaking roadside bushes, 1♂ 1imm., 24 February 1995 (JWB & ERB).

**Distribution.**—Found in China, Korea, Taiwan, Japan, Sumatra and Hawaii.

*Phintella planiceps* new species

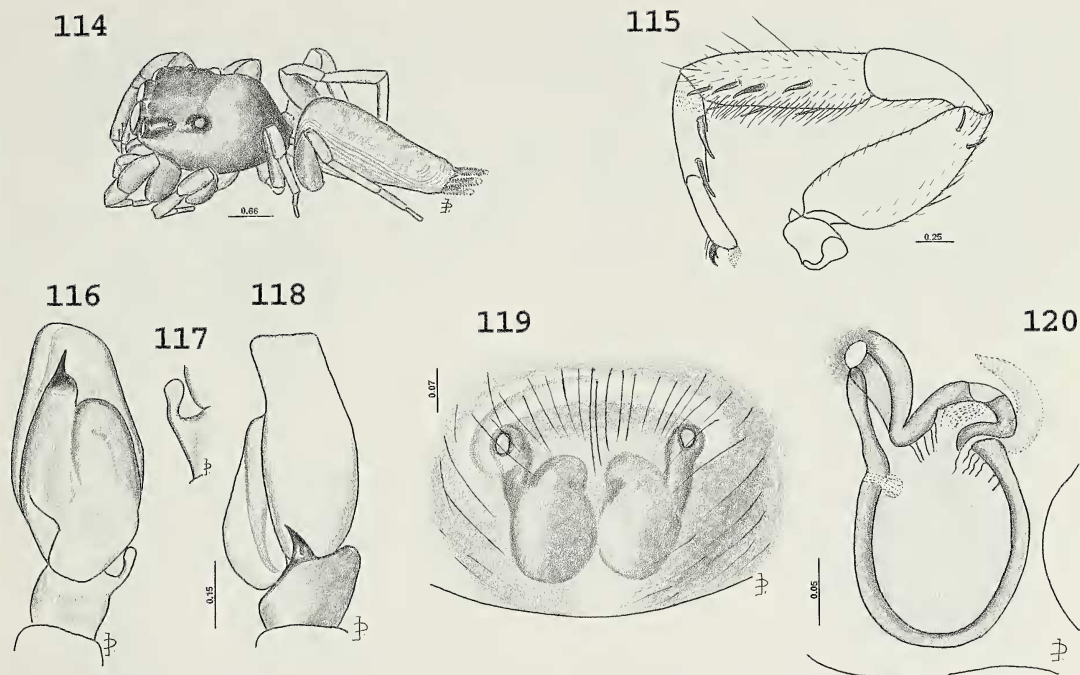
Figs. 114–120, Map 7

**Holotype.**—Male from Ponape, palm forest E of Kolonia, 200 ft. elev., 5 June 1973 (JWB & JAB) (BPBM).

**Etymology.**—The name *planiceps* refers to the plane flat surface of the cephalothorax.

**Diagnosis.**—Distinguishable from other members of the genus by the structure of the genitalia (Figs. 116–120). Male palpal bulb deeply indented proximally near base narrowing abruptly to a short thorn-like embolus. Epigynum with ducts much shorter than in other species.

**Description.**—*Male*: ( $n = 2$ ). Total length 5.6; carapace length 2.4; maximum carapace width 1.8; length of eyefield 1.3, 1.4; eye row I width 1.6, 1.7. Carapace brown, lightest anteriorly, eye field darker brown, thorax with indistinct lines radiating from small fovea; covered sparsely with small brown setae with



Figures 114–120.—*Phintella planiceps* new species, from Ponape, Caroline Islands. 114, General appearance of female; 115, Leg I prolaterally of male; 116, Palpal organ ventrally; 117, Tibial apophysis dorsally; 118, Palpal organ laterally; 119, Epigynum; 120, Internal structure of epigynum, showing single spermatheca and ducts.

sparse admixture of smaller whitish setae, not making any pattern; eye field with minute, sparse, adpressed and colorless setae, and a row of longer colorless setae above eyes I. An indistinct pattern of a few pairs of small yellow spots, one larger located marginally along abdomen; small colorless and brown upright setae and larger upright sparse bristles. Face low, indistinctly higher than diameter of AME, eyes I aligned in a straight line along their dorsal rims, diameter of ALE = half that of AME, clypeus obsolete, chelicerae indistinctly longer than diameter of AME. Face and chelicerae dark brown, eyes I surrounded by inconspicuous orange setae, cymbium apically lighter with whitish setae. One retrolateral cheliceral tooth, two prolateral cheliceral teeth. Ventral aspect of mouth parts, sternum and coxa I brown, coxae II–IV yellow. Abdomen yellowish-grey ventrally with two indistinct darker longitudinal streaks and two lines of small spots along the middle. *Legs*: Leg formula 1-4-2=3; tibia-patella I length 2.2, 2.4, patella-tibia III being shorter than IV. Leg I chestnut-brown, with patella, apical half

of metatarsus and tarsus yellow; legs II–IV lighter, yellowish-fawn. Ventral spines of tibia I: outer row, 3–4; inner row, 3. Sparse ventral greyish setae on tibia I and a row of greyish setae along ventro-retrolateral edge of femur I. *Palp*: see diagnosis and Figs. 116–118. *Female*: ( $n = 5$ ). Total length 5.0–6.8 ( $\bar{x} = 5.62$ ), length of carapace 2.3–2.8 ( $\bar{x} = 2.44$ ), maximum carapace width 1.7–2.2 ( $\bar{x} = 1.86$ ), eye field length 1.2–1.6 ( $\bar{x} = 1.36$ ), eye row I width 1.5–1.9 ( $\bar{x} = 1.64$ ). Coloration and cheliceral teeth as in male. *Legs*: Leg formula 4-1-2 $\geq$ 3; patella-tibia I length 1.6–2.1 ( $\bar{x} = 1.72$ ), with patella-tibia III shorter than IV. Ventral spines on tibia I as in male. *Epigynum*: An anterior depression is only external sculpture; oval large spermathecae and short sclerotized duct visible through tegument; opening antero-laterally, no membranous duct, pores in wall of spermatheca near junction with duct, additional pores above distal opening to the fertilization duct (Figs. 119, 120).

**Material examined.**—CAROLINE ISLANDS: Ponape, SW Sekere School, bushes on bank,



3♀ imm., 16 June 1973 (JWB & JAB). *Ponape*, E of Kolonia, palm forest, 200 ft., 1♂ (holotype) imm., 5 June 1973 (JWB & JAB). *Ponape*, Sokehs, shaking banana/breadfruit, 1♂ 11imm., 9 June 1973 (JWB & JAB). *Truk*, Moen Island, mixed forest above quarry, shaken from bananas, 2♀ imm., 12 June 1973 (JWB & JAB).

**Distribution.**—Known only from Ponape and Truk in the Caroline Islands.

Genus *Zenodorus* Peckham & Peckham  
1885

**Discussion.**—The genus contains 16 species known from Australia, New Guinea and Pacific Islands, half of them not recognizable from existing descriptions. The type species is *Zenodorus urvillei* (Walckenaer 1837) known from New Guinea, Australia, Aru and Ceram Islands; its taxonomic characters illustrated recently by Prószyński 1984: 151 and Davies & Żabka 1989: 230, 232, pl. 35 (as *Z. durvillei*). See Bonnet 1959 for discussion of the multiple spellings of this name). The genus *Mollika* Peckham & Peckham 1901 was synonymized with *Zenodorus* by Żabka (1988).

**Diagnosis.**—Small to medium unidentate salticids with cymbium of male palp 1.5–2.0 times length of bulb, and embolus forming a small tight coil at distal end of bulb (Figs. 124, 125). Female with epigynal openings lying in oval areas separated by a septum. Ducts of epigynum forming three-to-many loops which lie posterior to septum (Figs. 127, 129). With a characteristic black and white pattern (Figs. 122, 123). See also figures in Davies & Żabka (1989).

**Descriptive notes.**—Carapace with anterior swelling below second eye row, sides of carapace anteriorly parallel, eye field almost square, indistinctly shorter than broad, with flat area extending slightly behind eye field, posterior slope steep, relatively high. Abdomen oval, broad, but not broader than carapace, somewhat flattened, darkly pigmented with a pattern of white anterior edge and transverse lines in the posterior half. *Legs*: Robust and long, leg formula in males 1-3≥4-2, in females 4=3-1-2. *Palp*: of euphryine type, characterized by long apex of cymbium, embolus making a small, very tight and narrow coil atop bulb, tibia short, apophysis narrow and set diagonally, about half the length of the bulb. *Epigynum*: with two anterior grooves, separated by narrowing ridge,



Map 8.—Distribution of *Zenodorus microphthalmus* (\*) (known from throughout the Pacific) and *Zenodorus ponapensis* new species (■), known only from Ponape in the Caroline Islands.

spermatheca relatively large, and duct sclerotized, broad and making complicated bends, opening almost invisible, even after clearing.

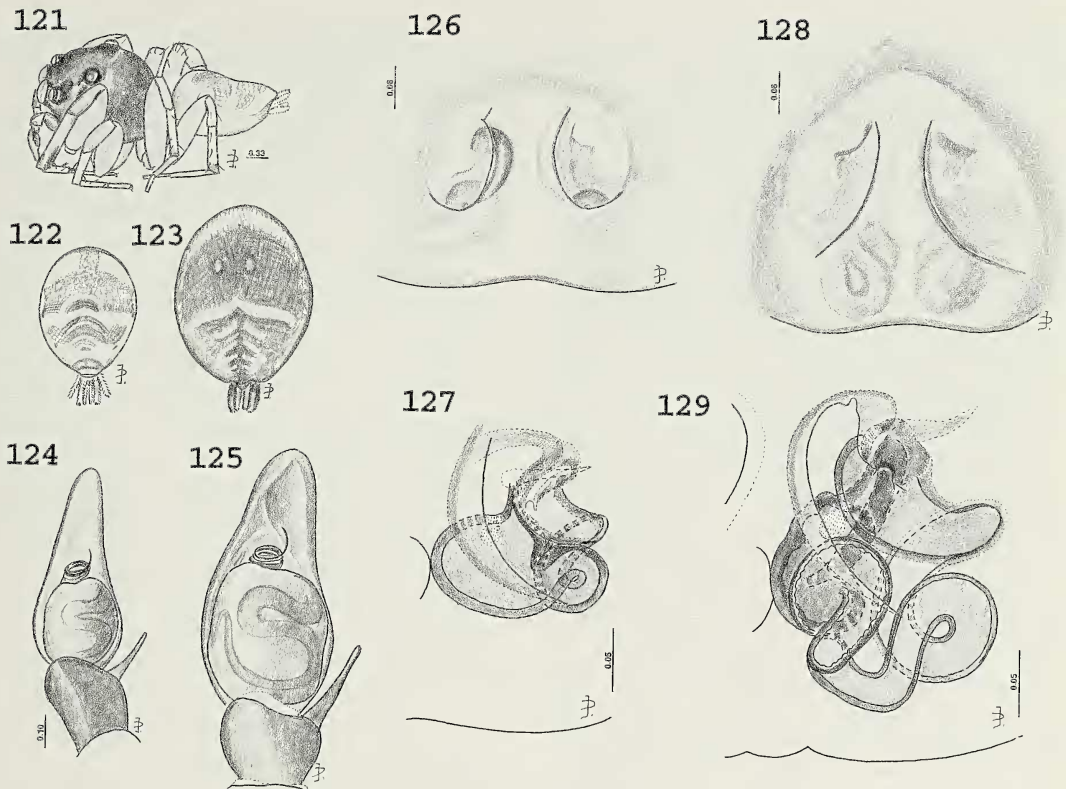
*Zenodorus microphthalmus* (L. Koch 1881)  
NEW COMB.

Figs. 123, 125, 128, 129; Map 8

*Jotus microphthalmus* L. Koch 1881.

*Mollika microphthalma*: (L. Koch): Simon 1900.

**Description.**—*Male and female*: Sexes very similar. Carapace blackish-brown with lighter area on anterior thorax, eye field darker, finely rugose with indistinct sparse, small dark setae, sparse white scales around lateral and posterior edges of eye field. Abdomen dark grey, indistinctly spotted lighter, with broad white belt along anterior edge and thin transverse line, interrupted medially; there are smaller lateral markings in front of spinnerets; these white areas are devoid of pigmentation and covered with whitish scales, sparse whitish scales occur also on grey areas, intermixed with small brown setae and bristles. Frontal view with strong contrast between intensely black chelicerae and dark, bare clypeus and white belt of setae running laterally from AME and under ALE; thin line of white setae surrounding eyes I, dark face contrasts also with the largely yellowish legs. Chelicerae also black in female but face brown, whitish setae more sparse and less prominent than in male, legs I and pedipalps brown. One retrolateral cheliceral tooth, one



Figures 121-129.—Comparison of the widely distributed species *Zenodorus microphthalmus* with *Zenodorus ponapensis* new species from Ponape in the Caroline Islands. 121, General appearance of male of *Zenodorus ponapensis* new species; 122, Abdominal pattern in female of *Zenodorus ponapensis* new species; 123, Abdominal pattern in female of *Z. microphthalmus*; 124, Palpal organ ventrally in *Z. ponapensis* new species; 125, Palpal organ ventrally in *Z. microphthalmus*; 126, Epigynum in *Z. ponapensis* new species; 127, Internal structure of epigynum showing single spermatheca and ducts in *Z. ponapensis* new species. 128, Epigynum in *Z. microphthalmus*; 129, Internal structure of epigynum showing single spermatheca and ducts in *Z. microphthalmus*.

(bicus) prolateral cheliceral tooth. Ventral view shows mouth parts blackish-brown, sternum brown, coxae greyish-brown, abdomen dark brownish-grey with four thin, light longitudinal lines. *Legs*: In female dark brown, in male more differentiated, light greyish-yellow, with dark brown tibiae I-IV, apical halves of femora III-IV and parts of some other segments. Ventral spines of tibia I: outer row, 3; inner row, 3; with spination indistinct, almost invisible among long and dark setae. *Palp*: Bulb larger and tibial apophysis longer than in *Z. ponapensis* (Fig. 125). *Epigynum*: Sclerotized duct makes 4-5 complicated bends (Figs. 128, 129).

**Material examined.**—**FIJI**: Viti Levu, Nausori Highlands, forest reserve, Koronsingalevu Block, elev. 1500 ft., sweeping/shaking, 1♂1♀, 27 May

1987 (JWB & ERB). Nandarivatu, on garage, 1♀1imm, 12 April 1987 (JAB). Nandarivatu, in house, 1♀2imm, 11 April 1987 (JAB). Nandarivatu, night-lighting around house, 1♀, 14 May 1987 (JWB). **CAROLINE ISLANDS**: Palau, Babelthuap, Ngaremlengui, 2♀, 21 April 1973 (JWB & JAB). Babelthuap, Airai, mixed tropical forest, woods below SDA school, 1♀, 11 March 1973 (JWB & JAB). Rock island east of Malakal, tree shaking, 1♀1imm, 12 February 1973 (JWB). Rock island east of Malakal, betel palm trash, 1♂5imm, 8 March 1973 (JWB & JAB). Angaur, mixed tropical forest, tree shaking, 1♀, 30 April 1973 (JWB, ERB & JAB). Angaur, in *Triumfetta* litter on beach, 1♀, 27 April 1973 (JWB, ERB & JAB). Angaur, under *Casuarina* bark, 2♂3♀8imm, 29 April 1973 (JWB, ERB & JAB). Angaur, *Casuarina* litter near beach, 1♂2imm, 29 April 1973 (JWB, ERB & JAB). Angaur, banana/palm thicket, 1♂4imm, 29 April 1973 (JWB, ERB & JAB). Angaur, in house,



1♂, 30 April 1973 (JWB, ERB & JAB). *Truk*, Moen Island, tree shaking, 1♂, 12 June 1973 (JAB & JWB). **MARSHALL ISLANDS:** *Kwajalein Atoll*, Ennylebegan Islet, shaken from trees, 1♂, 21 July 1969 (JWB). **NEW CALEDONIA:** *Loyalty Is.*, Lifou, 1♂, 26–28 March 1968 (J.L. Gressitt & T.C. Maa) (BPBM). We Lifou, 1♀, February 1962 (N.L.H. Krauss) (BPBM). Hienghene, 0–50 m, 1♀, January 1969 (N.L.H. Krauss) (BPBM). Mt. Ponie, 100–400 m, 1♀, February 1974 (N.L.H. Krauss) (BPBM). **VANUATU (= NEW HEBRIDES):** *Efate Is.*, Port Vila, 0–100 m, 1♂, December 1983 (N.L.H. Krauss) (BPBM). *Santo Is.*, Big Bay, elev. 0–30 m, Acc #1979.380, 1♀, 10 September 1979 (W.C. Gagne) (BPBM). 15 km N of Luganville, 100 m, Acc. #1979.360, 12 September 1979 (W.C. Gagne) (BPBM). **NEW GUINEA:** *Wau*, 1200 m, 1♂, 25 December 1961 (J. Sedlock) (BPBM). **SOLOMON ISLANDS:** *Guadalcanal*, Honiara, 100 m, 1♀, December 1971 (N.L.H. Krauss) (BPBM). Bougainville, S Kokure nr. Crown Prince, ca. 900 m, 1♀, 8 June 1966 (J.L. Gressitt) (BPBM). Kokure, Bougainville, 690 m, 1♀, 12 June 1956 (E.J. Ford, Jr.) (BPBM). **HAWAIIAN ISLANDS:** *Hawaii County*, Manuka State Park, mesic forest, elev. 1750 ft., 1♂2♀4imm., 11 February 1995 (JWB & ERB); Palani Road 1 mi. N of Kalua, desert shrubs, 1♀ 17 February 1995 (JWB & ERB); Manuka State Park nature trail, 1♂, 19 February 1995 (JWB & ERB); Puna District, Lava Tree State Park, 1♀2imm., 25 February 1995 (JWB & ERB).

**Distribution.**—Known from many islands throughout the Pacific Ocean.

*Zenodorus ponapensis* new species

Figs. 121, 122, 124, 126, 127; Map 8

**Holotype.**—Male from Caroline Islands, Ponape, palm forest E of Kolonia, 200 ft. elev., 5 June 1973 (JAB & JWB) (BPBM).

**Etymology.**—This species is named after Ponape, the only island on which it has been found.

**Diagnosis.**—Palpal organ smaller than in *Z. microphthalmus*, cymbium longer, pronouncedly narrowing anteriorly, epigynum smaller with median septum not narrowing anteriorly, copulatory duct short in proportion to spermatheca, and making two or three bends (Figs. 124, 125).

**Description.**—Both sexes very similar. Carapace brown, eye field darker, finely rugose with indistinct, sparse, small dark setae, sparse white scales around lateral and posterior edges of eye field. Light areas covered with colorless scales; whole abdomen with sparse, small brown setae and bristles. Frontal

view shows contrast between black-brown chelicerae together with brown face and largely light yellow legs. Sparse white spots of single setae scattered over face and edge of clypeus. Female with a lighter brown face and uniformly yellow legs. Ventral view has mouth parts brown, sternum brown, darker marginally, coxae whitish. Abdomen has pattern comparable with *Z. microphthalmus*; medially grey with broad whitish-yellow marginal streak.

**Male:** ( $n = 5$ ). Total length 3.8–4.4 ( $\bar{x} = 4.10$ ), length of carapace 2.0–2.4 ( $\bar{x} = 2.25$ ), maximum carapace width 1.5–1.7 ( $\bar{x} = 1.61$ ), eye field length 0.9–1.1 ( $\bar{x} = 1.07$ ), eye row I width 1.5 ( $\bar{x} = 1.50$ ). One retrolateral cheliceral tooth, one (bicuspid) prolateral cheliceral tooth. **Legs:** Leg formula 1-3-4-2; patella-tibia I length 1.1–1.8 ( $\bar{x} = 1.62$ ), with patella-tibia III equal to IV. Ventral spines of tibia I: outer row, 2; inner row, 2–3 (third spine, when present, weak). Legs II-IV yellow, legs I more differentiated, yellow with dark brown areas on patella, tibia and metatarsus. **Palp:** Apex of cymbium thinner and longer than in *Z. microphthalmus* (Figs. 124, 125).

**Female:** ( $n = 5$ ). Total length 4.6–5.9 ( $\bar{x} = 5.25$ ), length of carapace 2.0–2.6 ( $\bar{x} = 2.40$ ), maximum carapace width 1.7–2.0 ( $\bar{x} = 1.84$ ), eye field length 1.1–1.3 ( $\bar{x} = 1.25$ ), eye row I width 1.6–1.8 ( $\bar{x} = 1.68$ ). Cheliceral teeth as in male. **Legs:** Leg formula 4=3-1-2; patella-tibia I length 1.4–1.7 ( $\bar{x} = 1.57$ ); patella-tibia III longer than IV. Legs uniformly yellow. Ventral spines of tibia I as in male. **Epigynum:** sclerotized duct makes two or three bends (Figs. 126, 127).

**Material examined.**—**CAROLINE ISLANDS:** *Ponape*, E of Kolonia, palm forest, 200 ft. elev., 4♂ (including holotype) 3♀ 10imm, 5 June 1973 (JAB & JWB). SW of Sekere school, bushes/bank, 5♀ 9imm, 10 June 1973 (JWB & JAB). Nanpil, vegetation half-way up hill, 1♀ 1imm, 6 June 1973 (JAB & JWB). Sokehs I., shaking in banana/breadfruit, 1♂ 2♀ 2imm, 9 June 1973 (JWB & JAB). Top of mountain, tree shaking, 4♂ 3imm, 6 June 1973 (JAB & JWB). Tolotom, 2100 ft., 1♂, 26 August 1950 (P.A. Adams) (BPBM).

**Distribution.**—Known only from the island of Ponape in the Caroline Islands.

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